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RELAPSING FEVER AND OTHER SPIROCHAETOSES.

MARZINOWSKY (E.). Ueber das Zecken-Rückfallfieber. [**Tick Fever.**] —*Abhandl. a. d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol 2.) [Festschrift NOCHT.] pp. 314–318. With 4 text figs. [6 refs.] [Trop. Inst., Moscow.]

A description of Persian relapsing fever, which has been observed not only in Persia, but also in Transcaucasia and Turkestan. The disease is transmitted by *Ornithodorus tholosani* and possibly by a second species allied to *O. lahorensis*. Particulars are given of two Russian investigators who experimentally infected themselves with this disease by the bites of *O. tholosani*. One of them had recovered from an attack of *S. recurrentis* five years previously.

The author gives a table indicating the differences between European and Persian relapsing fever.

	European Relapsing Fever.	Persian Relapsing Fever.
Incubation	7–8 days.	5–6 days.
Duration of attacks	3–5 days.	1–2 days.
Number of attacks	3–5 days.	5–7 (and more).
Spleen	Enlarged, easily palpable.	Very hard and not always palpable.
Muscle pains	Present.	Present.
Type of disease	Severe, may be fatal.	Slight generally without any mortality.
Spirochaetes	Present in considerable numbers.	Rare, usually only found in thick films.

The respective spirochaetes also differ in their dimensions, the index of *S. recurrentis* being 2·84 (de Mello's method) or 2·8773 (Delamare's method), as compared with 3·4 and 1·861 in the case of *S. persica*.

Finally, the author remarks that this disease was probably introduced from Africa during the slave traffic and has become established locally in ticks belonging to the genus *Ornithodorus*.

E. Hindle.

PAMPANA (Emilio J.). **Notes on Colombian Relapsing Fever.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1928. Jan. 31. Vol. 21. No. 4. pp. 315–328. With 3 charts in text. [11 refs.]

An account of Colombian relapsing fever (*S. neotropicalis*) based on the study of ninety-one cases occurring in the province of Chocó, where the disease is endemic. The infection is transmitted by *Ornithodorus*

talaje which are often found in great numbers in native huts; and in view of the habits of these ticks, closely resembling those of bed-bugs, the disease is generally restricted to particular houses or other localities where people may sleep, such as ship's cabins.

In its main characters the disease closely resembles other varieties of relapsing fever. No lasting immunity seems to be conferred by an attack, as undoubted cases of reinfection were observed, yet many of the natives seem to be completely immune. In untreated cases the number of febrile attacks is usually three, but four have been observed. The first attack has an average duration of 64 hours; the first relapse occurs after about ten days interval and generally lasts for 40 hours; the succeeding relapses are at shorter intervals and for shorter periods.

The spirochaetes are nearly always very scanty in the peripheral blood and it is advisable to use thick films for diagnosis. In two cases the organisms were observed after the crisis, when the temperature was normal.

Neosalvarsan in doses of 0·45 gm. was found to be an effective cure and to prevent relapses.

E. H.

BEVERIDGE (G. E. G.). **The Louse-Borne Type of Relapsing Fever as Prevalent in the Anglo-Egyptian Sudan, 1926 and 1927.**—*Med. Jl. Australia.* 1928. Jan. 28. 15th Year. Vol. 1. No. 4. pp. 110–112.

The author considers the probable origin of this type of relapsing fever was from the black troops returning to French West Africa after the War in 1921. The disease has spread through British and French West Africa, reaching Wadai in 1926, and thence into Darfur. The number of deaths in the Sudan is estimated as at least 200,000 and, possibly as a result of its recent introduction, the mortality in untreated cases is between 60 and 80 per cent. As a rule only one relapse was observed, from the tenth to the eighteenth day, but a second relapse occurred between the 30th and 32nd days in a number of patients. The clinical features of the disease are described, and apart from their severity are fairly typical.

The author's main object was to prevent the disease spreading further east and to suppress the local outbreaks. The first was effected by posting quarantine stations on the main roads, and insisting on the delousing of all travellers, and their clothes; movement from infected to non-infected areas was forbidden. Local outbreaks were suppressed by general delousing measures, and by isolating the patients; these were treated with novarsenobillon in doses of 0·45 gm. intravenously for adults, and 0·3 intramuscularly for children. This treatment should be given preferably during the pyrexial period, and its use reduced the mortality to 7 per cent. The deaths nearly all occurred amongst old people weakened by long illness.

E. H.

NICOLLE (Charles) & ANDERSON (Charles). Sur la présence au Maroc du spirochète de la fièvre récurrente espagnole. [**The Presence in Morocco of the Spirochaete of Spanish Relapsing Fever.**]—*C.R. Acad. Sci.* 1928. Apr. 11. Vol. 186. No. 15. pp. 991–992.

The presence of Spanish relapsing fever has not been recorded previously from Morocco, but from a batch of *Ornithodorus marocanus*

obtained from Casablanca, the authors were able to infect experimental animals. By means of cross immunity experiments this strain of spirochaetes was found to be distinct from *S. duttoni*, *S. crocidurae* and *S. normandi*, respectively, but almost identical with the Spanish strain of the disease. The ticks which produced the infection came from the earth in the neighbourhood of a pig farm which had been abandoned about six years previously because of the large numbers of these acari, which normally feed on pigs.

The authors consider it infinitely more probable that the infected ticks had acquired the infection from some rodent or insectivorous animal, which may serve as a reservoir, than by the infection being transmitted hereditarily in the tick.

[Considering that *Ornithodorus moubata* infected with *S. duttoni* can transmit the infection hereditarily for longer periods than six years, without any infective feeds, it seems to the reviewer that such an explanation is more probable in the case described above than the theory of rodent or insectivorous reservoirs of the infection.]

E. H.

MATHIS (C.). Réceptivité des animaux de laboratoire vis-à-vis du spirochète récurrent humain de Dakar. [**Susceptibility of Laboratory Animals to the Relapsing Fever Spirochaete of Dakar.**]—*Bull. Soc. Path. Exot.* 1927. Oct. 12. Vol. 20. No. 8. pp. 826–829. [1 ref.] [Pasteur Inst., Dakar.]

A continuation of the author's observations on strains of relapsing fever obtained at Dakar [*ante*, p. 87]. Five strains were used and inoculated into monkeys, rabbits and wild mice, all of which were susceptible, and into cats, which were refractory. In mice, the spirochaetes generally appear in the blood 24 to 36 hours after inoculation, and after persisting until the fourth or fifth day gradually disappear without showing any distinct relapse, but the blood may remain infective until the 47th day. As usual, attacks confer immunity.

E. H.

MATHIS (C.). Immunité conférée à la souris grise par diverses souches de virus récurrent humain isolées à Dakar. [**Immunity conferred on Grey Mouse by Different Strains of R.F. at Dakar.**]—*Bull. Soc. Path. Exot.* 1927. Dec. 14. Vol. 20. No. 10. pp. 1038–1041. [Pasteur Inst., Dakar, Senegal.]

Cross-immunity experiments made with the Dakar relapsing fever spirochaete from five different sources, support the view that they all belong to the same variety.

E. H.

MATHIS (Constant). Identité du spirochète de la musaraigne et du spirochète humain dakarois. [**Identity of Spirochaetes of Shrew and Man in Dakar.**]—*C.R. Acad. Sci.* 1928. Jan. 3. Vol. 186. No. 1. pp. 46–48. [1 ref.]

By means of cross immunity experiments the author shows that the spirochaete [*S. crocidurae*] occurring in shrew mice at Dakar is identical with that found in human relapsing fever from the same locality; so presumably these animals may serve as a reservoir for

the disease. The manner in which the disease is communicated to man is unknown and Ornithodorus has not yet been found at Dakar, but by searching the burrows of shrew mice the author has succeeded in finding the nymphs of an undetermined species of tick which may be concerned in the transmission.

E. H.

MATHIS (C.). Transmission expérimentale du spirochète de la musaraigne par le pou. [**Experimental Transmission of the Shrew Spirochaete by the Louse.**]—*C.R. Acad. Sci.* 1928. Jan. 16. Vol. 186. No. 3. pp. 177–179.

——. Transmission expérimentale au singe du spirochète de la musaraigne, par le pou.—*Bull. Soc. Path. Exot.* 1928. Feb. 8. Vol. 21. No. 2. pp. 173–177. With 1 text fig. [3 refs.] [Pasteur Inst., Dakar.]

The author has tried to discover how *Spirochaeta crocidurae* is transmitted from the shrew mouse to man, but hitherto has failed to find any intermediate host which might be the agent.

The disease has been transmitted from monkey (*Cercopithecus patas*) to monkey by means of lice, and details are given of these experiments. Lice were fed on a monkey whose blood contained these spirochaetes and subsequently on a second monkey for eight days, but this animal remained uninfected. The contents of these lice were negative to microscopic examination and when inoculated into a third monkey produced no signs of disease, but blood taken from this animal and inoculated into six mice produced a very slight infection in two of them.

E. H.

LAGRANGE (E.). Les formes pulmonaires de la fièvre récurrente. [**Pulmonary Forms of Relapsing Fever.**]—*Bull. Soc. Path. Exot.* 1927. Oct. 12. Vol. 20. No. 8. pp. 716–718. [2 refs.] [Bact. Lab., Quarantine Council for Egypt, Alexandria.]

GIRARD's account of the association of pneumococcus with the plague bacillus in cases of pneumonic plague [*ante*, p. 317] has led the author to describe the symptoms of an outbreak of tick fever [*S. duttoni*] among the Belgian native troops during 1915 in the neighbourhood of Lake Tanganyika.

In the plains the disease showed the usual symptoms, but when the troops advanced into the high plateau of Kitega, the fever changed its character and many of the patients suffered from broncho-pneumonia during the febrile attacks; moreover, the mortality was greatly increased. When the troops again descended to the plains the pulmonary symptoms disappeared and the disease once more resumed its usual manifestations.

E. H.

GORI (Pio). Ricerche sperimentali con la *Spirochaeta recurrentis* (Dutton). [**Experiments with** *S. recurrentis.*]—*Bol. Istituto Sieroterap. Milanese.* 1928. Jan. Vo.. 7. No. 1. pp. 1–14. German summary pp. 9–10. [14 refs.]

An account of interesting experiments showing that the strains of spirochaetes of the original attack, and also of each successive relapse possess distinct immunity reactions.

A mouse was infected with a strain of *Spirochaeta duttoni* and sub-inoculations made into other mice with spirochaetes of the original attack and of each succeeding relapse, respectively. Mice that recovered from the resulting infections were subsequently reinoculated with spirochaetes of the first attack or of the relapses, and it was found that they were completely immunized against the type of spirochaete that caused the original infection in each case, but only partially immunized against spirochaetes from other stages in the disease.

Thus a mouse that had originally been infected by the inoculation of second relapse spirochaetes could not be reinfected by a subsequent inoculation of other second relapse spirochaetes, but showed infections of varying severity if inoculated with organisms of the first attack, or any of the other relapses. Similarly a mouse inoculated with organisms from the original attack was immune against the same type, but could be reinfected by the inoculation of spirochaetes taken at any of the relapses. The author explains these results by assuming that the spirochaetes acquire new immunological properties after each relapse. Tables are given showing the results of numerous experiments on the cross immunity of the various strains.

E. H.

Brussin (A. M.) & Rogowa (G. J.). Zur Frage der Pathogenese der Rezidive beim experimentellen Rückfallfieber. [**The Pathology of Relapses in Experimental Relapsing Fever.**]—*Cent. f. Bakt.* I. Abt. Orig. 1927. Dec. 20. Vol. 105. No. 1-3. pp. 39–54. [17 refs.] [Microb. Inst., Education Commissariat, R.S.F.S.R. Moscow.]

Employing the adhesion or thrombocytobarin test [*ante*, p. 106] for the identification of the spirochaetes in successive febrile attacks of animals infected with *S. duttoni* and *S. recurrentis* respectively, the authors are able to show very clearly the serological differences between the spirochaetes of the first attack and those of the second attack (or first relapse). After the second attack the capacity of developing antibodies seems to be lost in the great majority of cases.

Spirochaetes of the third attack of a mouse infected with *S. duttoni*, when exposed to the action of serum containing first attack antibodies, gave eight negative and two positive reactions ; but when the serum contained antibodies against both first and second attack spirochaetes, fifteen positive and six negative reactions were obtained .

Spirochaetes of the fourth attack gave similar results, being negative to first attack serum, but giving positive reactions with serum containing antibodies against first and second attack spirochaetes, or against first, second and third attack spirochaetes, or even with serum containing only third attack antibodies.

Experiments with the organisms from the brain of clinically recovered animals showed that some of the spirochaetes gave a slight reaction with first attack serum and some with second attack serum, but all of them gave well marked positive reactions with serum containing antibodies against both these races.

When mice were inoculated respectively with spirochaetes of the second, third, and fourth attacks, the spirochaetes of the first attack were serologically distinct from those inoculated, but the organisms of the first relapse were identical.

[These experiments are in continuation of those of Brussin (this *Bulletin*, Vol. 23, p. 113) and should be compared with CUNNINGHAM's observations (*loc. cit.* p. 112)].

E. H.

BRUSSIN (A. M.) & SCHAPIRO (S. L.). Zur Frage der genetischen Beziehungen zwischen den Spirochäten vom Typus Rekurrens. [**The Genetic Relationship of Relapsing Fever Spirochaetes.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Jan. Vol. 32. No. 1. pp. 13–24. [5 refs.]

Employing the adhesion test [sometimes known as RIECKENBERG's test, see this *Bulletin*, Vol. 24, pp. 968-70] the authors have tested the relationships of five strains of *Spirochaeta duttoni*, and two of *S. recurrentis*, with the rather curious result that six of the strains gave similar reactions, whilst a strain of *S. duttoni* from Brazzaville (Congo) seemed to be entirely distinct. This strain, however, had been kept going a much shorter time in the laboratory than the others, and the authors consider that ultimately it will probably agree with the others in its reactions. In support of this view a fresh strain of *S. recurrentis* from the haemolymph of an infected bug also gave reactions different from those of the laboratory strain.

As a result of the adhesion tests and also cross inoculation experiments, the authors consider that *S. recurrentis* and *S. duttoni* are merely varieties of one species which have acquired different characters under the influence of varying climatic conditions and adaptation to transmission by different hosts. When, however, these various strains are kept in the laboratory, under the same conditions and in the same host, they gradually lose these properties and cannot be distinguished by their immunity reactions.

E. H.

HERONIMUS (E. S.). Beiträge zur Kenntnis der Immunität bei Rekurrens. [**A Study of Immunity in Relapsing Fever.**]—*Cent. f. Bakt.* I. Abt. Orig. 1928. Feb. 15. Vol. 105. No. 6-8. pp. 394–402. [9 refs.] [Microb. Research Inst., Education Commissariat R.S.F.S.R., & Bact. Inst., IInd. State Univ. Moscow.]

The author has investigated the question of immunity in mice infected with a Berlin strain of *S. duttoni*, with special reference to the significance of the brain infection.

By reinoculating mice that had recovered from an attack 5 or 6 weeks previously, it was found that when 7 drops of heavily infected blood were used, 23 out of 25 animals showed a reinfection; with 3 drops, 16 out of 18; but with 2 drops, only 5 out of 17.

The author explains these results by assuming that the "humoral" immunity is very slight and labile, and insufficient to cope with the influx of a large number of spirochaetes. Examination of the brains of these reinfected mice showed that 58·3 per cent. contained spirochaetes, whereas after a single infection KRITSCHEWSKI [*ante*, p. 93] with the same strain found only 39·6 per cent. of the brains positive. It seems, therefore, that a reinfection increases the chance of the brain becoming infected.

Immunity in relapsing fever is considered to depend mainly on the persistence of the brain infection, and secondarily on the relatively weak "humoral" immunity of the blood, and other body fluids.

E. H.

SAGEL (W.). Beobachtungen ueber das Verhalten der Immunität bei mit Rückfallfieber künstlich infizierten Paralytikern. [**Notes on the Retention of Immunity in Cases of Paralysis infected with Relapsing Fever.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Apr. Vol. 32. No. 4. pp. 178–187. With 3 charts in text.

A number of observations on the immunity in relapsing fever, made in the course of treating more than 200 patients suffering from paralysis, with either *S. duttoni* or a Moroccan strain of spirochaetes.

In human patients recovered from *S. duttoni* infection, immunity against homologous strains was still present after 5½ years, but none against the Moroccan strain. Prolonged passage of the strain of *S. duttoni* in mice caused a considerable diminution of the virulence towards human beings, and therefore it was found best to pass the strain through a human host after 30 to 40 passages through animals.

Convalescent serum was only of use against the homologous strain, and had to be used in very large doses to be of any use.

When patients immune against *S. duttoni* were reinjected with the same strain, there was no increase in the strength of the immunity when the serum was tested a month after the last injection. If tested after only two weeks had elapsed an increase in strength was observed, but this is evidently only transitory.

E. H.

PLAUT (F.). Ueber gelungene Reïnfektionen mit Impfrekurrens und ueber die Ursachen der Rekurrensimmunität beim Menschen. [**Re-Infection with Relapsing Fever and the Immunity Question.**]—*Deut. Med. Woch.* 1928. Mar. 16. Vol. 54. No. 11. pp. 424–426. [10 refs.] [German Psychiat. Research Inst. ("Kaiser Wilhelm" Inst.) Munich.]

Although as a general rule recovery from relapsing fever seems to be followed by immunity [see above) the author has succeeded in two cases in reinfecting patients, one after an interval of five years and the other after eight years. [The original infections, however, had been treated by injections of salvarsan and mercury in one case, and neosalvarsan and sulphoxalate in the other, which may have interfered with the development of a complete immunity.]

Immunity against reinfection does not seem to depend on the presence of specific immune substances in the blood, for patients were found to be completely immune when reinoculated subcutaneously with spirochaetes, although no specific immune bodies could be found in their blood.

E. H.

MORETTI (P.). L'infezione sperimentale da *Spirocheta duttoni* nella terapia della leucemia e della poliartrite reumatica cronica. [**Experimental Infection with *S. duttoni* for the Treatment of Leukaemia and Rheumatoid Arthritis.**]—*Riforma Med.* 1928. Jan. 2. Vol. 44. No. 1. pp. 2–7. With 3 charts. [16 refs.] [Inst. of Path. & Clin. Med. R. Univ., Messina.]

Details are given of one case of leukaemia and two of rheumatoid arthritis treated by infection with tick fever. The results were so

favourable that the author considers they justify its application on a larger scale and he gives reasons for preferring this infection to malaria. The strain is easily maintained in infected ticks, and moreover relapsing fever is a milder disease and its febrile attacks are wider spaced. Except in very exceptional cases it does not produce any complications, and it can easily be cured by stovarsol administered by mouth.

E. H.

MELENEY (Henry Edmund). **The Effect of Splenectomy on the Course of *Spirochaeta recurrentis* Infection in Squirrels.**—*Abhandl. a. d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift NOCHT.] pp. 328–332. [4 refs.] [Peking Union Med. College, Peking.]

The author has studied the course of infection in the grey squirrel (*Sciurus vulgaris*) of *S. recurrentis* infections in North China. Normally this animal when inoculated intraperitoneally shows spirochaetes for one to five days after inoculation, but there is no systemic reaction and ordinarily no relapse occurs.

Twenty-five splenectomized squirrels were then inoculated and in these animals the intensity and duration of the initial attack were increased and this was followed by one or two relapses of varying intensity. The systemic effects were slight malaise, moderate anaemia, and often marked regenerate changes in the appearance of the red blood cells. Death occurs in a certain number, only when a relapse succeeds the first attack without any interval. It is evident, therefore, that the spleen prevents an excessive multiplication of the parasites and also affords protection against relapses.

It is of especial interest that splenectomy often causes the appearance in the blood of a species of Babesia and of a Bartonella-like organism, either of which may cause the death of the squirrel. Up to the present these organisms have not been observed in normal squirrels.

E. H.

PRIGGE (R.). & ROTHERMUNDT (M.). Experimentelle Untersuchungen über die Persistenz der Recurrensspirochäten im Gehirn der Mäuse. [**Experiments on the Persistence of Relapsing Fever Spirochaetes in the Brain of the Mouse.**]—*Ztschr. f. Hyg. u. Infektionskr.* 1928. Jan. 30. Vol. 108. No. 2. pp. 398–410. [9 refs.] [State Exper. Therapy Inst., & " Georg-Speyer " House, Frankfurt a.M.]

The marked difference between strains of spirochaetes that have been maintained in experimental animals for long periods, compared with those recently isolated from human cases of the disease, is well shown in the persistence of the spirochaetes in the brain. After inoculation with the latter type, practically every mouse showed a residual brain infection, whilst with the former, only three out of forty animals infected with various strains of spirochaetes, showed any persistence of these organisms in the brain.

The authors have investigated this problem, employing various strains of *S. duttoni* and *S. recurrentis*, and find that the difference is the result of variations in the amount of antibodies produced. The

"human" strains, recently isolated from human cases, produce only a slight immunity reaction and consequently there is not a sufficiently high concentration of immune bodies in the blood to kill the spirochaetes in the brain, where the circulation is comparatively feeble. Similarly when a chemotherapeutic agent is injected, parallel results are obtained, as the concentration of the drug may be sufficient to kill the organisms in other parts of the body but not in the brain. Experiments are given in support of the views advocated by the authors that the persistence of spirochaetes in the brain is merely a question of the degree of immunity developed by the host against the infection.

E. H.

PLAUT (F.). Untersuchungen ueber die Rolle der Milz für die Aufrechterhaltung der isolierten Gehirnspirochätose bei Recurrens-Ratten. [**Investigations on the Role of the Spleen in the Maintenance of Spirochaetes in the Brain of Rats infected with** *S. recurrentis.*]—*Klin. Woch.* 1928. Feb. 12. Vol. 7. No. 7. pp. 301–303. [18 refs.]

Rats that had clinically recovered from infection with *S. recurrentis* were splenectomized after varying intervals, in order to see whether removal of the spleen had any effect on the spirochaetes in the brain. After the operation all the rats showed Bartonella anaemia, but splenectomy had no effect on the brain spirochaetes, which did not appear in the blood.

By subsequent inoculations it was proved that spirochaetes were still present in the brains of these animals, but not in any other part of the body. In the few instances where spirochaetes reappeared in the blood of splenectomized rats, the author brings evidence suggesting that these are cases of latent infection not located in the brain, and his general conclusions agree with the view that once established in the nervous system the spirochaetes cannot be induced to reappear in the blood by any known method. [but see this *Bulletin*, Vol. 25, pp. 88 and 92.]

E. H.

LEVADITI (C.) & ANDERSON (T. E.). Neurotropisme du *Spirochaeta duttoni.* [**Neurotropism of** *S. duttoni.*]—*C.R. Acad. Sci.* 1928. Mar. 5. Vol. 186. No. 10. pp. 653–654. [7 refs.]

An article confirming BUSCHKE and KROO's discovery that spirochaetes may persist in the central nervous system long after these organisms have disappeared from other parts of the body. Working with a Brazzaville strain of *S. duttoni*, the authors found that the brains of mice that had recovered from the disease still contained the organisms in an invisible form, for although the infected nervous tissue was carefully examined, no trace of spirochaetes could be discovered. Nevertheless the virus was not filterable, from which the authors assume that it is intimately associated with the nerve cells. The organism in the nervous system is not resistant to immune bodies present in the blood; also it will produce infection in the blood when animals are inoculated intra-cerebrally.

E. H.

SCHAUDER (Hermann). Zur Frage der Spirochätenpersistenz im Zentralnervensystem und ihrer chemotherapeutischen Beeinflussbarkeit bei experimenteller Rekurrens. [**The Persistence of Relapsing Fever Spirochaetes in the Central Nervous System and the Effects of Chemotherapeutic Agents on them.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Jan. Vol. 32. No. 1. pp. 1–13. [7 refs.]

Using a strain of *S. recurrentis* in rats and mice, the author gives details of experiments devised mainly to test the effect of various chemotherapeutic agents on the infection in the brain. By means of subinoculating from different parts of the central nervous system of a rat that had been infected more than 3 months previously and been negative to blood examination since the first attack, it was shown that the infection was still present in the cerebral hemispheres, cerebellum, optic tracts, and spinal cord of the animal. The spirochaetes seem to be more abundant in the deeper parts of the brain than at the surface, for inoculations of the outer layer of the brain were negative, possibly owing to the presence of more bloodvessels and consequently greater exposure to immune bodies of the blood.

Experiments were made on the effects on the spirochaetes in the brain of three compounds, neosalvarsan, Albert S 102, and another arsenical preparation, Böhringer 242. Albert S. 102 seemed slightly more efficacious than the other two, but even when the drug was administered at the beginning of the infection and caused the spirochaetes to disappear from the blood, in many cases the central nervous system was found to be infected; but when the initial treatment was continued for three to five injections at intervals of two or three days, the brain also was sterilized.

On the other hand, immune animals, in which the spirochaetes have become established in the brain, are rarely sterilized even by long continued injections. Consequently, in searching for a more efficacious therapeutic agent for the cure of spirochaetal infections, attention should be directed to the effect of the drug on the parasites in the brain, which prove so resistant to all known methods of treatment.

E. H.

JAHNEL (F.) & LUCKSCH (F.). Ueber das Vorkommen der *Spirochaeta Obermeieri* in der Hirnsubstanz des Menschen. [**The Occurrence of *S. obermeieri* in the Human Brain.**]—*Med. Klin.* 1927. Dec. 30. Vol. 23. No. 52 (1203). pp. 2003–2004. With 3 text figs. [3 refs.]

The authors made sections of the brains of two soldiers who died of relapsing fever during the War, and found spirochaetes [*S. recurrentis*] in both of them. One showed very few parasites whilst in the other they were abundant.

E. H.

STREMPEL (Rudolf). Experimentelle Untersuchungen an subokzipita in den Liquor mit Rekurrens infizierten Kaninchen. [**Experimental Study of Rabbits infected with Relapsing Fever by Inoculation into the Cerebrospinal Fluid.**]—*Deut. Med. Woch.* 1928. Apr. 27. Vol. 54. No. 17. pp. 687–689. [11 refs.]

In contrast with the results usually obtained by intraperitoneal inoculation of relapsing fever spirochaetes into rabbits, when the

organisms are introduced directly into the cerebrospinal fluid, the percentage of animals showing a subsequent infection of the central nervous system is very high. Thus out of 16 rabbits infected in this manner, five contained spirochaetes in both the blood and cerebrospinal fluid; five in the latter alone; and one in the blood alone. Five were negative in both, but subsequent subinoculations of brain material into mice gave positive results in two cases. The infected rabbits could be cured by two injections of neo-silver-salvarsan and were then negative in the central nervous system. As might have been expected, rabbits infected in this manner developed the specific antibodies in the blood, as proved by mixing the serum of recovered animals with spirochaetes and inoculating the mixture into mice.

E. H.

BESCHKINA (R. I.). Das Ausmessen der Spirochäten. [**The Measurement of Spirochaetes.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Jan. Vol. 32. No. 1. pp. 43–46. With 4 text figs.

The author compares de MELLO's index for measuring spirochaetes with DELAMARE's [spelt Delemare] method, in which the length and maximum height of the coils is taken into account. Three cases of Persian relapsing fever in their measurements all agreed with each other, but differed markedly from typical *Spirochaeta recurrentis*. Delamare's method was found to give better results and is recommended for the morphological differentiation of relapsing fever spirochaetes.

E. H.

BRUYNOGHE (R.). **A Contribution to the Study of Relapsing Fever.**—*Jl. State Med.* 1928. Jan. Vol. 36. No. 1. pp. 3–20. [37 refs.]

A useful summary of some of the recent work on relapsing fever with special reference to the biology of spirochaetes, including experiments made by the author, mainly with *S. duttoni*.

After testing various culture media the following modification of Ungermann and Galloway's methods was found to be the most satisfactory:

A small quantity (1 cc.) of egg yolk is placed in a narrow sterile tube and coagulated in a cup-shape by keeping the tube slanting, whilst rotating it in boiling water. Rabbit serum diluted to 1/6 with glucose Ringer solution (glucose 1 gm., Na Cl 9 gm., Ca Cl_2 0·24 gm., $NaHCO_3$ 0·1 gm., water to 1,000 cc.) is then added, and the medium immediately covered with a layer of sterile liquid paraffin about 1 cm. deep and the tube then heated at 56°–58° C. for an hour. Before using the tube, a drop of sterile blood (man, rabbit, mouse,) is introduced, and the tube rotated in order to distribute the corpuscles evenly throughout the medium. A fibrinous reticulum is formed which afterwards contracts.

The addition of blood is unnecessary when it is intended to isolate spirochaetes from blood, as enough is introduced when seeding the culture tube. After being seeded the tubes are kept at 36° to 37° C. and two or three days cultivation is sufficient to show several spirochaetes in each microscopic field. The cultures grow until the eighth day and are especially rich at the bottom of the tubes. They remain alive for a fortnight but it is better to make subcultures every 7 days. The sugar is indispensable as spirochaetes seem to use it in their metabolism and the addition of either glucose or laevulose to the medium in which they are living produces increased motility.

The paraffin helps to keep the pH constant, as this should be in the neighbourhood of 7·4. The cultures retain their pathogenicity for some time, but after ten months *Sp. duttoni* became irregularly and weakly pathogenic for man and animals, although the cultures were as abundant as at the beginning.

This culture method is recommended for the diagnosis of mild cases of blood infection. Serological tests gave inconstant results [but there is no evidence that the author distinguishes the differences between spirochaetes of the first attack and those of the relapses].

Relapsing fever was found not to affect the results of the Bordet-Wassermann test provided the antigen was prepared according to the Bordet-Ruelens technique.

Attempts to vaccinate animals with killed cultures were unsuccessful and attenuated cultures also failed to produce immunization.

Relapsing fever produces a real immunity in both man and animals, due to the persistence of a latent infection either in the brain or some other internal organ. In mice that have recovered two or three months previously, an infection with *Spirillum minus* or trypanosomiasis will often produce the reappearance of spirochaetes.

The author's strains of spirochaetes were found to have very little sensibility to neosalvarsan, as doses relatively 5 to 20 times as strong as those used for man failed to sterilize mice infected with *S. duttoni*.

In human cases, however, its curative action is well known, but the suggestion is offered that arsenical compounds produce only an attenuation of the infection, so that its evolution becomes torpid and does not manifest itself by any symptoms.

E. H.

NICOLLE (Charles) & ANDERSON (Charles). De certaines règles à suivre dans l'expérimentation sur les spirochétoses sanguines. [**Rules to be observed in Experimentation with Blood Spirochaetes.**]—*Arch. Inst. Pasteur de Tunis.* 1927. Dec. Vol. 16. No. 4. pp. 333–346.

An account of technical details recommended by the authors for the use of those working with strains of relapsing fever.

In the first place it is very important to avoid the possibility of introducing a new virus, as blood spirochaetes are widespread in nature. Consequently, wild animals should always be regarded with suspicion as possible sources of contamination, and domestic animals, such as white mice and rats, should invariably be used for the maintenance of strains. The possibility of the laboratory animals becoming infected by means of ticks or other intermediaries should also be borne in mind, and care taken to avoid any such contamination.

In view of the fact that animals may remain infected with spirochaetes long after they have apparently recovered, the authors recommend that after being used for the passage of any strain an animal should be destroyed, unless it is required for experiments on immunity and the like.

The authors maintained five strains of relapsing fever at Tunis, viz. : Tick fever and the Dakar Strain [*S. crocidurae* from the shrew-mouse] which the authors consider identical ; both these are easily maintained in mice and white rats : Spanish relapsing fever, for which the guineapig is the most suitable host : the spirochaete of a desert gerbille, *Meriones shawi*, transmitted by *Ornithodorus normandi*,

which can be maintained in white mice : and finally European relapsing fever, the most difficult of all to maintain in the laboratory owing to its feeble pathogenicity, for which the alternation of white mice and monkeys is recommended. The best method of inoculation is merely to introduce a drop of infected blood into the eye, as the spirochaetes pass through the conjunctiva and produce an infection more closely approximating the normal than if one inoculates parasites intraperitoneally. This method is said to be quite as certain as any other, and succeeds when the spirochaetes are so rare in the medium as to be invisible by ordinary examination.

After insisting on the great importance of labelling and keeping complete records, the authors point out the necessity of care in handling the animals and infected material, in order to avoid the risk of laboratory infection, which is considerable in view of the fact that the virus is able to pass through any mucous surface, or the slightest abrasion. [The number of cases of laboratory infection with relapsing fever is well known, and workers will fully appreciate the necessity of these precautions.]

E. H.

MATHIS (C.). Au sujet des précautions à prendre dans l'étude expérimentale des virus récurrents. [**Methods adopted in the Experimental Study of Relapsing Fever Viruses.**]—*Bull. Soc. Path. Exot.* 1928. Feb. 8. Vol. 21. No. 2. pp. 179–182. [3 refs.] [Pasteur Inst., Dakar.]

Whilst agreeing in the main with NICOLLE and ANDERSON'S suggestions (see above) the author considers that the ordinary wild grey mouse of Senegal is an exception to the general rule against employing wild animals for the maintenance of relapsing fever spirochaetes. This animal is said to be free from any natural infection and also has very few ectoparasites. The mice are kept in fairly tall glass bottles covered with a heavy lid and to facilitate examination a few ordinary wooden cases, such as are used for protecting tubes containing pathological specimens sent by post, are placed in each bottle. The mice take refuge in the cases, one in each, but the tail protrudes and consequently the animals can readily be picked up without any danger of them escaping or biting the operator. By holding the mouse by its tail and rotating it for a few seconds, it becomes dazed and can then be handled with ease.

The author employs a different colour for each of the strains maintained in the laboratory and this colour is applied not only to the label of the receptacles but also to some part of the body of each infected animal. By using different parts of the body it is easy to distinguish each individual when several mice inoculated with the same strain are kept together in the same cage.

E. H.

VAN NITSEN (R.). Le traitement de la fièvre récurrente Africaine par le stovarsol sodique. [**Treatment of African R.F. by Sodium Stovarsol.**]—*Ann. Soc. Belge de Méd. Trop.* 1927. Nov. Vol. 7. No. 2. pp. 177–180.

Intravenous injections of the sodium salt of stovarsol in doses of 0·5 to 1·5 gm. caused an immediate disappearance of the febrile

symptoms in patients suffering from tick fever. The usual method of treatment was to inject 0·5 gm. the first day, 1·0 gm. the second, 1·5 gm. the third, and this last dose was repeated every 48 hours; each patient received ten injections without showing any signs of intolerance. In order to effect a complete cure, doses amounting to at least 15 gm. were required and in view of the more favourable results recorded in other localities the author states that in their neighbourhood (Katanga) the disease seems to be particularly resistant to arsenicals.

E. H.

SCHOFIELD (A. T.). **Treatment of Spirillum Fever with Stovarsol.** [Memoranda.]—*Brit. Med. Jl.* 1927. Dec. 17. p. 1140.

An article advocating the use of stovarsol for the treatment of tick fever [*S. duttoni*], as it has the advantage of being taken by mouth and consequently can be entrusted to the ordinary intelligent native. Six tablets, each of 4 grains, swallowed whole, were administered for two successive days and found to cure all toxic symptoms and prevent relapses.

E. H.

KRITSCHEWSKI (J. L.) & FRIEDE (K. A.) Weitere Untersuchungen der prophylaktischen Eigenschaften des Stovarsolans. [**Further Studies on the Prophylactic Value of Stovarsol.**]—*Arch. f. Dermat. u. Syph.* 1927. Dec. 27. Vol. 154. No. 1. pp. 178–186. [10 refs.] [Microb. Inst., Education Commissariat, R.S.F.S.R., Moscow.]

The authors have studied the prophylactic value of stovarsolan [a Russian preparation of stovarsol] in relapsing fever in rats and mice.

When rats were infected with *S. duttoni* and given stovarsol by mouth twice daily from the date of inoculation, out of 19 animals only one showed spirochaetes in the blood, but seven contained spirochaetes in the brain; the remaining 11 animals showed no signs of infection. On the other hand, 31 rats inoculated with *S. recurrentis* and similarly treated, all remained negative both to blood and brain examination. The strain of *S. duttoni* came from Berlin and is known to be arsenic-fast, whilst the *recurrentis* strain was from Frankfurt and is very susceptible to salvarsan.

Using the same two strains in mice, it was found that the effect of stovarsol in the case of *S. recurrentis* infections depended to some extent on the number of spirochaetes in the blood, for a dose which cured every mouse that showed one parasite in 50 fields of the microscope, failed to cure a single mouse when the blood contained numerous spirochaetes.

With reference to dosage, approximately double the amount of stovarsol was required to sterilize animals infected with the Berlin strain as compared with those infected with the Frankfurt strain.

A comparison was made between the prophylactic value of novarsolan [neosalvarsan] and stovarsol, both administered per os; although the former had slightly more effect on the spirochaetes, on the other hand it was very much more toxic.

The authors conclude that for spirochaetal infections stovarsol as a prophylactic agent, administered by mouth, surpasses all other known arsenical compounds.

E. H.

GAUJOUX (E.) & STODEL (G.). Action de l'acétylamino-oxyphényl-arsinate de diéthylaminoéthanol sur le nagana de la souris et sur la fièvre récurrente de la souris (spirochète de Dutton). [**Action of A.-a.-o. of D.-e. on Nagana and Relapsing Fever in Mice.**]—*C.R. Soc. Biol.* 1927. Vol. 97. No. 36. pp. 1681–1683. [Gen. Physiol. Lab., Sorbonne & Clin. Labs., Paris.]

Acetyl-amino-oxyphenylarsinate of diethylamino ethanol was found to be a very efficient drug for the treatment of mice infected with *Trypanosoma brucei* or *Spirochaeta duttoni*. The compound was mixed with twenty times its volume of saline solution and the resulting liquid injected once daily for three to six days. The curative dose for nagana was 0·009 cc. to 0·011 cc. equivalent to 0·00045 to 0·00055 gm. of arsenic, and for spirochaetosis, 0·01 cc.

E. H.

ESQUIER (C. A.). Traitement de la fièvre récurrente par l'acétylarsan. [**Treatment of Relapsing Fever by Acetylarsan.**]—*Bull. Soc. Path. Exot.* 1928. Feb. 8. Vol. 21. No. 2. pp. 113–121. With 7 text figs. [3 refs.]

The author recommends the use of acetylarsan as more efficacious than 914 for the treatment of relapsing fever. The compound is supplied in sterile ampoules containing 3 cc. of the solution and six Algerians infected with the disease were each cured by a single subcutaneous injection of 2 cc., equivalent to a dose of 0·1 gm. of arsenic.

A French soldier, however, who suffered from the disease and received an injection at the height of the first relapse, showed a typical second relapse in spite of the treatment.

E. H.

WILLMORE (J. Graham). **A Case of Intermittent Pyrexia associated with and probably due to Broncho-Spirochaetosis, shown April 6, 1927.**—*Proc. Roy. Soc. Med.* 1928. Jan. Vol. 21. No. 3. pp. 474–476 (Sect. Trop. Dis. & Parasit. pp. 28–30).

Details are given of the clinical history, symptoms and treatment of a case which seems to agree with the descriptions of broncho-spirochaetosis. The clinical evidence showed that febrile attacks were invariably preceded by and associated with an exacerbation of the chest condition, and that each attack was associated with the expectoration of the typical pink, glairy mucus, containing numerous spirochaetes. In the apyrexial periods spirochaetes were either not found or were very rare.

The sputum of twenty cases of chronic and subacute bronchitis was examined as a control and spirochaetes were either absent or present in very small numbers.

E. H.

COLAS-BELCOUR (Jacques). Note sur *Ornithodorus Normandi*, ses caractères differentiels et sa biologie.—*Arch. Inst. Pasteur de Tunis.* 1928. Mar. Vol. 17. No. 1. pp. 35–39. With 4 figs. on 1 plate.

GRASSBERGER (Alfred). Beitrag zur Kenntnis des Vorkommens von Pseudospirochaeten im menschlichen Blut.—*Folia Haematologica.* 1928. Mar. Vol. 36. No. 1. pp. 17–24. [7 refs.] [Third Med. Clinic, Univ., Vienna.]

NICOLLE (Charles), ANDERSON (Charles) & COLAS-BELCOUR (Jacques). Sur un spirochète sanguicole nouveau (*Sp. Normandi*), transmis par un ornithodore (*Orn. Normandi*), hôte des terriers de rongeurs nord-africains.—*Arch. Inst. Pasteur de Tunis.* 1928. Mar. Vol. 17. No. 1. pp. 1–34. [7 refs.]

ONGKIEHONG (H. F.). Eenige gevallen van Broncho-spirochaetosis.—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1927. Vol. 67. No. 6. pp. 895–898. [Provincial Lab., Singarada, Dutch E. Indies.]

RATE-BITE FEVER.

MOOSER (H.). Etudes expérimentales sur le sodoku. [**Experiments on Rat Bite Fever.**]—*Schweiz. Med. Woch.* 1927. Nov. 26. Vol. 57. No. 48. p. 1154.

An interesting account of experiments with rat-bite fever in guineapigs which invariably succumbed to the infection, and rabbits, which soon recovered. After recovery the blood of the latter contained antibodies which destroyed the spirilla in dilutions of 1 in 50 to 1 in 100 ; even after a year the serum was still active, though to a less degree. Guineapigs do not develop antibodies against this organism and consequently succumb.

The spirilla are found to persist in the lymphatic glands of the rabbit, or in the skin, even a year after recovery, when the blood was proved to contain antibodies. In order to explain this curious fact the author is led to assume : (1) that autogenous antibodies are unable to pass through the walls of the blood vessels ; and (2) an acquired immunity, which persists, is kept up by the presence of a latent infection. Suggestive experiments are recorded in support of these views. An axillary lymphatic ganglion was removed from a rabbit that had recovered from an attack of rat-bite fever. The ganglion was cut into two halves, one of which was inoculated directly into a guineapig, whilst the other half was mixed with the serum of the rabbit from which it had come, and then inoculated into another guineapig. The first animal developed a typical attack of the disease whilst the second remained uninfected. Similarly, infection was produced in guineapigs by inoculation of pieces of skin from recovered rabbits.

In support of the view that a latent infection is necessary for the continued presence of antibodies in rabbits, the author succeeded in sterilizing " recovered " animals by continued injections of neosalvarsan and Albert 102, and found that in such rabbits the antibodies gradually disappeared and the animals became susceptible to a second infection.

E. Hindle.

SCHOCKAERT (J.). Sur l'unicité des souches de *Spirillum minus.* [**The Unity of Strains of** *Spirillum minus.*]—*C. R. Soc. Biol.* 1928. Mar. 2. Vol. 98. No. 8. pp. 595–597. [8 refs.] [Bact. Lab., Univ. Louvain.]

The author has compared three strains of *Spirillum minus*, one from a case of sodoku, and the others from a rat and mouse, respectively. The results of inoculations into patients and cross immunity experiments support the view that all the various strains of this organism constitute only one species with varying degrees of virulence.

E. H.

ABE (M.) & SHIMODA (T.). [**Therapeutic Effect of Oxyacetyl-Aminophenylarsinic Acid on Experimental Rat-Bite Fever in Rabbits.**]—*Acta. Dermat.* Kyoto, Japan. 1927. Sept. Vol. 10. p. 347. [Summarized in *Jl. Amer. Med. Assoc,* 1927. Dec. 24. Vol. 89. No. 26. p. 2227.]

Rabbits infected with rat-bite fever were successfully treated by injections of the above mentioned compound. When the dose used varied from 0·2

to 0·35 gm. per kilogram of body weight the local lesions disappeared in two days and the blood spirochaetes in three, and when the dose was reduced to 0·025 gm., six doses at intervals of two or three days were sufficient to cure all symptoms of the disease.

E. H.

SCHOCKAERT (J.). L'action de quelques agents chimiothérapiques dans l'infection expérimentale à *Spirillum minus*. [**Action of Chemotherapic Agents in Experimental** *S. minus* **Infection.**]—*C.R. Soc. Biol.* 1928. Mar. 2. Vol. 98. No. 8. pp. 597–598. [Bact. Lab., Univ. Louvain.]

The author has tested the effects of a large number of compounds on mice and guineapigs infected with *Spirillum minus*. Neosalvarsan was found to be by far the best agent, but it was necessary to continue the injections for several days, as single injections were invariably followed by relapses.

E. H.

MASCI (Carlo). Sopra un caso di sodoku. [**A Case of Rat-Bite Fever.**]—*Ann. di Med. Nav. e Colon.* 1927. May–June. Year 33. Vol. 1. No. 5–6. pp. 342–347. [" La Spezia " Naval Hosp.]

A man of 20 years was bitten on the forearm by a rat and applied iodine the following morning. Twenty days later he had a rise of temperature to 40° C., which fell to normal by the third day. A second febrile attack occurred after an interval of four days. This was repeated, with little systemic disturbance. The spleen was slightly enlarged, as were also the glands, especially those in the right axilla, which were painful. There was a typical local rash, and a relative increase in the large mononuclears (14 per cent.) at the expense of the polymorphonuclears (58 per cent.). Examination of the blood, by smears and culture, and of gland-juice were negative for the spirillum. Treatment by neosalvarsan in graded doses from 0·15 gm. to 0·9 gm. at weekly intervals for six weeks brought about a cure, and the blood-picture became normal. The patient was in hospital for 2½ months. The disease is uncommon in Italy, about 30 cases only having been described.

H. Harold Scott.

WATSON (Jerre). **A Case of Sodoku.**—*Southern Med. Jl.* 1928. Apr. Vol. 21. No. 4. pp. 325–326.

A case diagnosed entirely by clinical symptoms, which seems to be the first record of sodoku in Alabama.

E. H.

INFECTIOUS JAUNDICE AND OTHER LEPTOSPIROSES.

BAERMANN (G.) & ZUELZER (Margarete). Die Einheitlichkeit aller tier- und menschenpathogenen Spirochäten vom Typus der *Spirochaeta icterogenes* syn. *icterohaemorrhagiae* und der mit ihr verwandten Wasserspirochäte vom gleichen Typus. II. Mitteilung. [**The Identity of all Animal and Human Pathogenic Spirochaetes of the Type** *Spirochaeta icterogenes* **syn.** *icterohaemorrhagiae* **and also the Allied Water Spirochaetes. Part 2.**]—*Cent. f. Bakt.* I. Abt. Orig. 1928. Feb. 15. Vol. 105. No. 6–8. pp. 345–367. [Central Hosp., Petoemboekan, Sumatra & Reichs Health Office, Berlin.]

This important paper is a continuation of that reviewed in the *Bull. of Hygiene*, Vol. 2, p. 777, in which details were given of three strains of water leptospira, isolated in Sumatra, which all became virulent to guineapigs after passage through a certain number of animals. *

The present article gives fuller evidence in support of the view that all animal and human pathogenic leptospira and also the allied water leptospira belong to one species, called by the authors *Spirochaeta icterogenes*.

Concerning the morphology of these forms it is generally agreed that there is no certain method of distinguishing between any of them, and therefore the authors at once proceed to consider the question of virulence.

Attention is called to previous work on this subject and in particular details are given of nine strains of free-living water leptospira, all of which have been made pathogenic in various ways; *e.g.*, a strain of water leptospira WAZ (Schuffner) had been kept in the laboratory for a considerable period; 2 cc. of a fresh culture were inoculated (subcutaneously, intracutaneously and intravenously) into a woman. After 4 days this woman showed a slight rise in temperature for 6 days without any other clinical signs. Blood was taken from the patient by vein puncture every day for 14 days from the date of the experiment, and inoculated into guineapigs. One of these animals, that had been inoculated intraperitoneally with blood collected on the 6th, 7th, and 8th days, showed typical symptoms of jaundice, after an incubation period of 26 days. This animal was killed and examined for leptospirae but none found; sections of the organs, however, showed typical lesions of Weil's disease.

The blood and organs were inoculated into three other guineapigs and cultures made from the heart-blood. All three animals showed leptospira on the third day and all died on the sixth day with typical symptoms of Weil's disease.

The patient's serum agglutinated and dissolved the original Waz strain, but had no affect upon the strain after passage through guineapigs, and also had no affect upon the water strain or any human or animal strain. Therefore, passage through two animals had completely changed the nature of this spirochaete, and moreover this change has persisted in subsequent cultures and passages.

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* *Klin. Wochenschr.* 1927. No. 21. pp. 979–985.

The authors next proceed to compare the serological and immune reactions of various strains of human and animal leptospira with the water forms. A polyvalent horse serum with a titre of 8,000 was used, prepared by the inoculation of 136 Petoemboekan, 5 European Weil, and 3 *L. icteroides* strains. Agglutination and lysis was tested on 8 water strains which all gave negative results, but, with one doubtful exception, all these gave strongly positive reactions after passage through an animal.

Thirty-nine kinds of sera, including prepared rabbit antisera, and the blood of patients, were tested against cultures of 94 strains of Petoemboekan leptospira, 5 European strains of Weil's disease, 5 strains of *L. icteroides*, 1 strain of *L. hebdomadis*, 3 rat strains, and 6 pathogenic water strains.

The results indicate considerable divergences in the serological properties of the various strains and lead the authors to remark that the value of serological and immune biological reactions seem to be very problematical. For example, the serum of one patient (No. 8) who suffered from a severe, typical, and fatal attack of Weil's disease, agglutinated only two strains of Weil's disease (from Petoemboekan) and one of *L. hebdomadis*, but was negative with numerous other strains, including several Petoemboekan, the European Weil, *L. icteroides*, etc.

The leptospiras of this same patient, No. 8, were agglutinated by the sera of two other patients infected with Petoemboekan strains of Weil's disease, but were unaffected by all other sera used in this series of experiments.

L. hebdomadis antiserum agglutinated 7 strains of leptospira from typical cases of Weil's disease but had no affect on 129 other strains. With regard to *L. icteroides*, the authors find that it is undoubtedly identical with ordinary strains of Weil's disease.

Concerning leptospiral infections the authors are of the opinion that it is not possible to group them into different diseases caused by distinct strains of organisms, but that the explanation of differences in the clinical symptoms is to be looked for in quantitative variations in the infective dose, in variations in the virulence of the leptospirae, and in the constitution and temporary state of health of the infected human or animal organism. Consequently, they group together all the previously described leptospiras as one species, which they consider to be *Spirochaeta biflexa* syn. *icterogenes*, syn. *icterohaemorrhagiae*.

[The authors' conclusions raise the very difficult question of what is to be regarded as constituting a species. In dealing with the majority of bacteria and spirochaetes it is impossible to distinguish them with any degree of certainty by morphological characters alone, and consequently biological characters are usually employed. The experiments recorded in the paper reviewed above certainly support the view which has been advocated by the authors but, in spite of their results, it is a debatable point whether a retention of individual names for what many other authors have found to be biologically distinct races, is not more convenient. Concerning the experiments with *L. hebdomadis*, the possibility of its natural occurrence in the cases giving positive reactions does not seem to be entirely eliminated. If the authors' views are accepted the name of this leptospira should be *Spirochaeta* (*Leptospira*) *interrogans* Stimson, who in 1907 gave this name to what was undoubtedly the same organism.]

E. Hindle.

BAERMANN (G.) & SMITS (E.). Diagnose, Klinik, Epidemiologie und Therapie der kurzfristigen Weilschen Erkrankung. III. Mitteilung. [**Diagnosis, Symptoms, Epidemiology and Treatment of Mild Weil's Disease.**]—*Cent. f. Bakt.* 1. Abt. Orig. 1928. Feb. 15. Vol. 105. No. 6-8. pp. 368–383. With 8 charts & 1 text fig. [Central Hosp., Petoemboekan, Sumatra.]

The authors have studied nearly 400 cases of a variety of Weil's disease occurring in Sumatra, which is distinguished from the typical disease by its short duration and comparative mildness of the symptoms. This disease is characterized by the presence of leptospira in the blood, the occurrence of a short attack of fever generally lasting 2 to 4 days, then a subfebrile or normal interval of 1 to 4 days, followed by another febrile attack. There may be as many as five relapses, gradually diminishing in severity, but commonly only two of them occur. The most characteristic symptoms, distinguishing it from ordinary Weil's disease, are the changes in the conjunctiva bulbi and the sclera. From the turned-up fold of the conjunctiva on the bulbus against the cornea, there is a very marked injection of the blood vessels, not unlike con junctivitis, producing an acute, diffuse red inflammation, with a very distinct network of vessels and capillaries on the conjunctiva and sclerotic. Secretion is not increased and the bulbus has a yellowish-red dull opalescent sheen. This appearance is said to be the most constant symptom and is present in both mild and severe cases. Blood culture should be practised, however, in order to make certain of the diagnosis.

As culture media the authors employed 1 part of rabbit serum in 10 parts of either distilled or spring water, heated for 1 hour to 65°C. on three successive days. A few drops of the patient's blood, taken during the febrile attack, are mixed with this medium and kept in the dark at room temperature (24–30° C.). About 90 per cent. of the cases where blood was taken in the first febrile attack gave positive results after periods varying from 8 to 30 days.

Ordinary centrifuging of the blood, and also triple centrifuging, were tested but the results were most unsatisfactory, 30 leptospira being observed in only 6 out of 30 cases, which all gave positive results with the culture method. The inoculation of 5 to 10 cc. of venous blood from the patients into guineapigs gave positive results in 70 per cent. of the cases. In 20 per cent. the symptoms were those of typical Weil's disease, whilst the other 50 per cent. only showed the milder symptoms of the type with short febrile attacks. The prognosis is favourable, the mortality in about 400 cases being only 1 per cent., although it should be noted that some of the patients were treated with serum.

Reinfection seems to be rare, but in 2 cases occurred after 8 months.

Concerning the epidemiology of the disease the authors bring forward very convincing evidence that it is derived from water during bathing. This explains the incidence of the infection, which is almost entirely restricted to males, the females and children rarely going to bathing places and rarely becoming infected.

The authors discuss at length the various types of leptospiral diseases that have been described and show that they all seem to be varieties of one widely distributed species, originally present in water, which under varying conditions has acquired varying pathogenic properties.

For treatment the authors employed polyvalent horse serum prepared by injecting 100 local strains of leptospira, 3 *L. icteroides* strains, 5 European Weil strains, 5 water strains, 3 rat strains and *L. hebdomadis*.

The horse was injected as follows: 10 cc. of the mixture on the first day; 20 cc. after 8 days; and at 10 day intervals 40, 100, and 200 cc. respectively. Anaphylaxis is liable to occur owing to the presence of rabbit serum in the culture media.

This polyvalent serum, which is only used in severe cases, is given to the patients in fairly large doses. On the first day of the attack 60–90 cc.; then every other day 30–40 cc. until 200 cc. have been injected.

[This interesting paper is in continuation of the views described above by Baermann and Zuelzer and should be consulted in the original for more complete details.]

E. H.

Baermann (G.) & Smits (E.). Spirochaetosis ictero-haemorrhagica ziekte van Weil. Mededeeling en algemeen referaat over ruim 300 meerendeels lichte gevallen, waargenomen in het Centraal Hospitaal Petoemboekan, Sumatra's O.K. [**Spirochaetosis Icterohaemorrhagica (Weil's Disease).**]—*Nederl. Tijdschr. v. Geneesk.* 1927. Dec. 10. Vol. 71. 2nd Half. No. 24. pp. 2478–2495. With 4 charts. [6 refs.]

A group of obscure febrile conditions caused by spirochaetes and termed hitherto spirochaetosis febrilis is considered by the authors as a form of Weil's disease. They investigated about 300 slight cases which occurred during the last few years amongst Javanese coolies on plantations on the East Coast of Sumatra. They regard the different spirochaetes causing the various types of fevers as belonging to the same species and the clinical features of these conditions are to be considered as representing only gradations of Weil's disease. An injection of the conjunctiva is said to be a characteristic sign of the slighter forms of the disease. The main source of infection they consider to be water and mud, where spirochaetes of this type were frequently found. They do not attach much importance to rats as carriers of the disease. In severe cases injections of serum are recommended.

H. Lwow.

Schüffner (W. A. P.). De tegenwoordige stand van het leptospirovraagstuk. [**The Present State of the Leptospira Question.**]—*Nederl. Tijdschr. v. Geneesk.* 1928. Mar. 31. 72nd Year. 1st Half. No. 13. pp. 1552–1562.

After briefly dealing with the morphological and biological properties of leptospirae in general, the author quotes the diseases which, as far as our present knowledge goes, are caused by parasites of this subgenus: Weil's disease, Nanukayami, the genuine form of blackwater fever (Schüffner), of which the specific leptospira has not yet been cultivated, leptospirosis febrilis (Vervoort, Kouwenaar). *L. icteroides* (Noguchi) is identical with *L. icterohaemorrhagiae* and recent research has shown the absence of leptospira in well established cases of yellow fever in Africa. Baermann and Smits (later together with M. Zuelzer) cultivated leptospira from about 200 patients in Sumatra, and found the strains to be serologically much at variance. The difficulties they

experienced in differentiating between these strains induced these authors to neglect all the differences and to consider all the strains as varieties of *L. icterohaemorrhagiae*, differing chiefly in their antigenic structure. According to this theory, *Spirochaeta biflexa* (Wolbach & Binger) is the saprophytic type of *L. icterohaemorrhagiae*, which by prolonged cultivation (ZUELZER) or quicker by animal passages can change into the parasitic type. Others, including the author and his assistants, obtained only negative results in their attempts to show such a change in their strains. Schüffner emphasizes the serological specificity of the strains of leptospira (which is shown in tabular form) and stability of their serological properties in culture. This renders him sceptical of the views of BAERMANN [see above].

Though in most of the cases of Weil's disease in Holland the infection was caused evidently by submersion in polluted water, so far all attempts to cultivate the leptospira from those waters (canals, etc.) have yielded negative results. Contrary to the experiments in which repeated animal passages proved to be necessary to render the leptospirae pathogenic, in the accidental human cases a single dip in the polluted water was sufficient to cause the infection, which fact points to the presence of virulent leptospira.

Accepting the actual results of the experiments of BAERMANN, the author thinks that they are open to other interpretation. Admixture of virulent leptospira to the water strains, activation of leptospira living as commensals in the experimental animals (guineapigs) under influence of the unspecific shock caused by the injections, and—last, but not least—the possibility of spreading of leptospiroses in the guineapig stock by unknown ways of transmission in laboratories where much work in this respect is being done. Before we believe in such a pronounced lack of stability of the leptospirae as BAERMANN'S experiments would show, every possible source of error must be excluded.

W. J. Bais.

FLETCHER (William). **Recent Work on Leptospirosis, Tsutsugamushi Disease, and Tropical Typhus in the Federated Malay States.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1928. Jan. 31. Vol. 21. No. 4. pp. 265–282. With 17 figs. (8 on plates).

The present communication is confined to the author's observations on leptospirosis in the Malay States and contains a very useful account of the disease in that region and methods of diagnosis.

The author's culture medium consists of 5 cc. to 7 cc. of sterilized tap-water or distilled water, with the addition of 0·5 cc., or a little less, of rabbit's serum. In making a culture from a patient's blood about 0·5 cc. of blood is inoculated into the tube, which is generally examined with dark background at the end of a week. The earliest date on which leptospira were found was the second day, but this is exceptional and the cultures are often negative until the fifth or sixth day. One culture was negative on the sixteenth day, although numerous parasites were present three days later.

The diagnosis of the disease by examination of the patient's blood, stained by Fontana's method, gave unsatisfactory results, as leptospira were observed in only three cases out of thirty-two.

The results of cultures, when made from the patients' blood collected up to and including the seventh day, were always positive (except

one case of contamination), but later than this were rarely successful. Similarly, positive results were always obtained when guineapigs were inoculated with the patients' blood taken up to the seventh day. As a rule about 2 cc. of blood was used for the inoculation.

The results of examination of the patients' urine show that the leptospira continue to exist in the tubules of the kidney after they have disappeared from the blood. In most cases they were found for the first time about the fifteenth or sixteenth day, increased up to the twentieth day, and disappeared about the twenty-fifth.

Serological Classification.—Very interesting results were obtained when an attempt was made to classify the different strains according to their serological reactions. The organisms from 26 patients were examined, and also other strains obtained from various sources, and found to fall into six distinct groups. Group 1 included *L. icterohaemorrhagiae*, two strains of *icteroides*, two dog strains (OKELL), and only one of the Malay patients. Group 2, Akiyami A (*L. hebdomadis* Type A), included six Malay patients, numerous local black rats and one dog. Group 3, Akiyami B (*L. hebdomadis* Type B), included only one local patient in addition to the type strain obtained from INADA. Group 4, *L. pyrogenes* Vervoort, contained thirteen of the local cases in addition to the type. Group 5, Nallathamby, included three of the Malay cases and Group 6, Eruthyan, also contained three of these local cases. [The existence of these different serological types in patients apparently showing very similar symptoms, is of importance in considering the relationship of these different strains of Leptospira.]

Clinical considerations. Only one out of thirty-two cases ended fatally, and this was the only local case in which the leptospira gave the serological rections of *L. icterohaemorrhagiae.* The most constant symptoms observed were the sudden onset and great prostration, and especially the agonizing muscular pain and tenderness. The presence of casts and albumin in the urine, although only in small quantity, is a characteristic feature and serves to distinguish the disease from dengue, with which the Malay leptospirosis has probably been confused in the past. The pronounced redness of the eyes is another important symptom, but jaundice was only well shown in seven patients. The duration of the fever varied from six to twelve days, and in five patients there was a secondary fever which came on five to eleven days after the first one and lasted for three to nine days.

A dog was found suffering from leptospirosis, and the organism was identical with *L. hebdomadis* of the Akiyami A type. Leptospira were also found in about 26 per cent. of the local black rats and serologically the majority of the strains belonged to the same group as the local dog strain. The remaining strains did not belong to any of the six groups previously mentioned.

Leptospira were isolated from the Kuala Lumpur water supply and other sources by using Hindle's method, and the organisms were inoculated into guineapigs. In some there was a rise in temperature on the tenth day, and in one case spotted lungs were observed, but the organism could never be recovered from any of the animals.

[The reviewer, in conjunction with Major H. C. BROWN, has found the simple culture medium used by the author to give very satisfactory results. The serological results contained in this article should be compared with those of BAERMANN and ZUELZER, reviewed above p. 602.]

E. H.

BROWN (H. C.). **Epidemic Jaundice in the Andaman Islands.**—*Lancet.* 1928. Feb. 25. p. 388. [10 refs.] [Wellcome Bureau of Scient. Research, London.]

The author has tested the sera of certain cases of leptospiral infection from the Andaman Islands, employing the adhesion phenomenon and in one case agglutination tests in addition. The results show that the organism responsible for producing epidemic jaundice in the Andamans is serologically identical with the Rachmat and Deli A strains from Sumatra, but not with the Salinem strain also from Sumatra nor with any of the typical Weil's disease leptospira. The examination of the kidney and liver from one of these Andaman cases, by Dr. A. C. STEVENSON, suggests that it differs in some respects from typical Weil's disease. In particular, spirochaetes resembling *S. recurrentis* were found in the convoluted tubules of the kidney and typical leptospira in the cells and straight tubules. VERVOORT also found both types in the cultures from the blood of Sumatra patients.

[These observations suggest the possibility of a mixed infection, but this would not explain the undoubted serological distinctness of this strain when compared with strains from typical cases of Weil's disease.]

E. H.

DEUSKAR (V. N.). **Weil's Disease, as occurring in the Andamans.**—*Indian Med. Gaz.* 1928. Jan. Vol. 63. No. 1. pp. 1–10. With 1 map & 5 charts. [12 refs.]

A lengthy and diffuse article giving details of 23 cases diagnosed as Weil's disease on clinical grounds, occurring in Haddo Hospital during 1926. Apparently, leptospira were not seen in any of the patients and the few guineapigs inoculated were also negative.

E. H.

HOSOYA (Seigo) & STEFANOPOULO (G. J.). Sur la différenciation du *Leptospira icteroides*, du *Spirochaeta icterohemorragiae* et de certains autres spirochétidés voisins. [**Differentiation of** *L. icteroides* **and** *L. icterohaemorrhagiae.*]—*C. R. Soc. Biol.* 1927. Dec. 2. Vol. 97. No. 33. pp. 1447–1450. [1 ref.] [Pasteur Inst., Paris.]

The authors have made comparative tests of the serological properties of six varieties of *Leptospira* viz.: *L. icteroides* Noguchi (3 strains); *L. icterohaemorrhagiae* Inada and Ido (3 strains); the spirochaete of Japanese Autumn Fever (Types A and B of KITAMURA and HARA); *L. hebdomadis*, and *L. pseudo-icterohaemorrhagiae.* The spirochaetes were cultured in the usual media at 29° C. and found to resemble each other very closely in morphology and general characteristics. When exposed to strictly anaerobic conditions all the organisms died within 24 hours. The first three varieties are virulent to guineapigs, whilst the last three rarely have any effect on them.

Agglutination tests, immunization experiments and the Pfeiffer tests were applied to these strains, and as a result the authors conclude that their strains of *L. icteroides* are identical with *L. icterohaemorrhagiae*, their results agreeing with those obtained by THEILER and SELLARDS [this *Bulletin*, Vol. 24, p. 709], SCHÜFFNER and MOCHTAR [*l.c*, p. 714]

and PUNTONI. On the other hand, Japanese Autumn Fever Types A and B, *L. hebdomadis* and the water leptospira were clearly distinct from the preceding and from each other.

E. H.

ZUELZER (Margarete). Zur Hydrobiologie der *Spirochaeta icterogenes* syn. *biflexa* in den Tropen. IV. Mitteilung. [**The Biology of** *Sp. icterogenes* **syn.** *biflexa* **in the Tropics.**]—*Cent. f. Bakt.* I. Abt. Orig 1928. Feb. 15. Vol. 105. No. 6-8. pp. 384–393. [Central Hosp., Petoemboekan, Sumatra.]

A general account of the biology of *S. icterogenes* in which the author compares its occurrence in Europe with that in the tropics, with special reference to the East coast of Sumatra.

This water leptospira was found to be almost ubiquitous, both in fresh water and in the sea. It grows best on slimy surfaces and is especially abundant in the presence of Beggiatoa and other bacteria, which raise the sulphur content of the water. Also they are more abundant when the nitrogen content of the water is high. Employing Hindle's cultural method, or by merely adding serum to the water, leptospira were found in very many different types of water, from clear running streams down to stagnant pools. The organisms were commonly found in association with other kinds of spirochaetes such as *S. pseudorecurrentis*, *S. sumatrana*, *S. pseudopallida*, etc., and with Spirilla, Beggiatoa, Oscillatoria, and various types of Protozoa. They were also seen in a sample of water from Bangkok, Siam.

E. H.

UHLENHUTH & SEIFFERT (W.). Zur Chemotherapie der Weilschen Krankheit. [**Chemotherapy in Weil's Disease.**]—*Med. Klin.* 1928. Apr. 13. Vol. 24. No. 15 (1218). pp. 584–585. [4 refs.] [Hyg. Inst., Univ. Freiburg i. B.]

The authors have tested the effects of various colloidal preparations on guineapigs infected with a virulent strain of *Leptospira icterohaemorrhagiae* that usually killed the host in ten to twelve days. The results of a large number of experiments show that " Bismuth Yatren A " has a marked effect on the organism if the drug is administered at the right stage of the disease. For example, approximately 100 guineapigs were inoculated with leptospira and given curative doses on different days of the disease. Those treated on the sixth and seventh days all lived whilst of those treated earlier or later than this about half died.

In view of these results the authors consider that this drug might be tried for syphilis and recommend the intravenous injection of 2 cc. every other day, or an injection of 1 cc. alternating with 3 cc. at the same intervals.

The way in which the drug acts is still being investigated. When an infected guineapig is injected with this bismuth compound, leptospira disappear from its blood, but are still present in the internal organs. These organisms are resistant to bismuth, as was found by subinoculations. Later, however, the leptospira disappear entirely from the body and moreover such an animal is completely immune, not only against reinfection with the homologous strain, but also against other varieties of the organism.

E. H.

MATSUSHITA (Masanobu). [**Prevalence of Spirochetosis Icterohemorrhagica in the Coal Mines Chikuho.**]—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1927. June. No. 2526. [Summarized in *Japan Med. World.* 1927. Nov. 15. Vol. 7. No. 11. p. 332.]

Among the cases of Weil's disease investigated by the author, the incidence in mine labourers was 0·517 per cent., whilst in coolies working in the open air it was only 0·06 per cent. The effects of prophylactic inoculation against the disease was tested in four mines with the following results.

	Incidence before inoculation.	Incidence after inoculation.
	Per cent.	Per cent.
First mine	0·95	0·26
Second mine ...	0·32	0·05
Third mine ...	2·62	1·09
Fourth mine ...	3·19	0·51

E. H.

LOEPER, SCHULMANN (E.) & LEMAIRE (A.). Un cas de spirochétose compliqué de souffle orificiel de l'aorte. [**Case of Weil's Disease with Aortic Aneurism.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1928. Feb. 2. Year 44. 3rd Ser. Vol. 52. No. 3. pp. 83–88. With 2 text figs. [6 refs.]

The description of a case of Weil's disease complicated by aortic aneurism, supposed to have been at least partially caused by the infection, as the swelling gradually subsided after recovery from the disease. The patient was in the habit of frequenting the bathing establishments on the Seine, to which the author attributes the source of infection.

E. H.

MULHOLLAND (H. B.) & BRAY (W. E.). **Spirochetal Jaundice : a Case in Virginia.**—*Jl. Amer. Med. Assoc.* 1928. Apr. 7. Vol. 90. No. 14. pp. 1113–1114. [4 refs.] [Univ. of Virginia Hosp., University, Va.]

The eighth proved case of this disease reported in the United States. The diagnosis was confirmed by inoculating a guineapig with the patient's blood taken on the fifth day of the disease. The animal died on the eighth day and leptospira were found in the kidney.

E. H.

HIYEDA (Goro). [**On the Fetal Infection by** *Spirocheta icterohemorrhagiae.*]—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1927. Sept. No. 2537. [Summarized in *Japan Med. World.* 1928. Jan. 15. Vol. 8. No. 1. p. 15.]

A report of a case of abortion of a 4 months old foetus by a woman suffering from Weil's disease. Although histopathological examination was negative, the author advances reasons for believing that the foetus had been infected.

E. H.

TAKAGI (Sampei). [**Passage of the Spirocheta of Akiyami-Fever and Weil's Disease through the Placenta.**]—*Aichi Igakkwai Zasshi* (*Jl. Aichi Med. Soc.*) 1927. June. Vol. 34. No. 6. [Summarized in *Japan Med. World.* 1928. Jan. 15. Vol. 8. No. 1. p. 17.]

The author observed spirochaetes in the placentas of guineapigs infected with both Weil's disease and Akiyami fever but the organisms could not be

found in the foetuses. It was found that the spirochaetes had been taken up by ciliated cells and other tissue on the outside of the embryo which seem to protect the foetus from invasion from the maternal body.

E. H.

WILBERT (R.). & DELORME (M.). Note sur la spirochétose ictéro-hémorragique du chimpanzé. [**Spirochaetosis of the Chimpanzee.**]—*C.R. Soc. Biol.* 1928. Feb. 10. Vol. 98. No. 5. pp. 343–345. [2 refs.] [Pasteur Institutes at Paris and at Kindia, French Guinea.]

The sera of two chimpanzees that had succumbed to leptospiral infection as previously described [*ante*, p. 102], were found to immobilize strains of *L. icterohaemorrhagiae* and *L. icteroides*, whilst the serum of normal animals had no effect.

[It is not clear why the authors persist in using the name "Sp. anthropopitheci," as it is obvious they are dealing merely with an outbreak of Weil's disease in chimpanzees.]

E. H.

KLARENBEEK (A.) Leptospirae (Spirochaeta ictero-uraemiae canis) als oorzaak van icterus, nephritis en uraemie van den hond. [**Leptospirae causing Jaundice, Nephritis, and Uraemia in Dogs.**]—*Tijdschr. v. Diergeneesk.* 1928. Mar. 1. Vol. 55. No. 5. pp. 227–234. English summary p. 235. With 3 figs. on 1 plate. [31 refs.] [Veter. Faculty, Royal Univ., Utrecht.]

A description of leptospiral jaundice in dogs [see this *Bulletin*, p. 103 and *Trop. Vet. Bulletin*, Vol. 13, p. 86] for which the author proposes the name of "Azotaemic Uraemia in dogs." The leptospira were found in the urine and tubules of the kidneys, and biologically closely resembled those of Weil's disease. The author considers that the dog, as well as the rat, may be able to infect man with the disease. Nevertheless he suggests the name "Spirochaeta ictero-uraemiae canis" for this organism from the dog.

[There is neither justification nor necessity for this cumbrous name, as the organism was previously named by LUKES and is shown by the author's own experiments, apart from those of OKELL, DALLING and PUGH, to be practically indistinguishable from the ordinary leptospira of Weil's disease.]

E. H.

SARDJITO (M.) & POSTMUS (S.). **The Occurrence of Leptospirae among the Rat Population at Weltevreden.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1927. Part 3. pp. 680–689. With 2 folding tables. [11 refs.]

An examination of the rats at Weltevreden revealed the presence of leptospira in 4 out of 23 *Mus decumanus*, whilst 17 *Mus rattus* were all negative. Previous observers were unable to cultivate the organism, but the present authors succeeded in growing three of the strains in Noguchi's serum agar, by inoculating the tubes with renal emulsions from the infected rats. These leptospira were not affected by immune sera prepared from European and American strains, nor by a polyvalent anti-haemorrhagic serum. In guineapigs one was very virulent, two moderately so, and the fourth non-virulent.

These strains were subsequently compared with cultures of other leptospira when grown in Vervoort's serum-peptone-salt-medium, to which different sugars had been added. A vigorous growth was obtained with the leptospira strains Baermann, Baltimore, F., Krimmenic, Senen and Waterlooplein, in medium containing 1 per cent. glucose, lactose, arabinose, xylose, isodulcite, dulcite, mannose and inulin, respectively, and the pH concentration remained unchanged. A "Yellow Fever Strain" Le Blanc, did not show any growth and died out in serum-peptone medium containing 1 per cent. levulose, but grew well in the presence of the remaining sugars; levulose also slightly impeded the growth of the other strains. All the leptospira grew better when 0·5–1 per cent. arabinose or inulin was added to Vervoort's medium. The "Yellow Fever" and all other strains used in the experiment grew well in Noguchi's serum-agar containing 1 per cent. levulose.

[As the authors suggest, the behaviour of the so called Yellow Fever strain to levulose-serum-peptone is probably the result of long continued cultivation, since it is no longer virulent for young guineapigs.]

E. H.

DE ARAUJO (Eduardo). Da existencia de *Leptospira icterohaemorrhagiae* (Inada e Ido) Noguchi, em ratos da Bahia. [*Leptospira icterohaemorrhagiae* **in Rats in Bahia.**]—*Sciencia Med.* 1928. Feb. Vol. 6. No. 2. pp. 64–78.

The first cases of Weil's disease notified in Brazil occurred in Para in 1911 when a small outbreak arose. During the last three years investigations have shown that rats in Bahia, especially those caught in the Disinfectorio Central, are acting as reservoirs of the leptospira, and that infection is commonly direct. Whether there is any vector capable of transmitting the infection from man to man is not determined. The author succeeded in obtaining pure cultures of the organism from the heart-blood of infected animals on the fifth or sixth day of disease. This is important in view of the fact that many strains have but a feeble degree of virulence when passed to guineapigs from rats. The impression that the leptospira is locally distributed in the kidneys is due to the tendency for them to be held up in the twists of the convoluted tubules in the cortical region. The part played by the rat is believed to be that of restoring the virulence of an organism which has become deprived of this virulence by being subjected to outside influences.

H. Harold Scott.

SABRAZÈS (J.). Mode de coloration par la fuchsine phéniquée de Ziehl du spirochète de la fièvre jaune. [**Staining of** *Leptospira icteroides* **by Carbol Fuchsin.**]—*C.R. Soc. Biol.* 1928. Jan 27. Vol. 98. No. 3. pp. 239–240. [2 refs.]

The author finds that if films of *Leptospira icteroides* are first fixed according to Fontana-Tribondeau's method and then treated with 5 per cent. tannic acid, they can easily be stained with Ziehl's Carbol Fuchsin. The stain should be poured on the film, heated, allowed to cool and then poured off, this process being repeated four times, after which the film is washed in distilled water and allowed to dry.

E. H.

RENAUX (E.). Technique de coloration des spirochètes à propos d'une note de J. Sabrazès. [**Staining of Spirochaetes in Reference to Sabrazès' Note.**]—*C. R. Soc. Biol.* 1928. Mar. 23. Vol. 98. No. 11. pp. 866–867. [4 refs.] [Pasteur Inst., Brussels.]

A note calling attention to the fact that the method described by SABRAZÈS [see above] is practically identical with one described by RENAUX and WILMAERS in 1917, differing only in the preliminary fixation with formol acetic. The author now uses the following method for staining *S. pallida* :—

The films are dried in the air, fixed in Ruge's formol for 2–4 minutes and rinsed in 95 per cent. alcohol ; then mordanted for 10 minutes in a saturated aqueous solution of picric acid, washed in water, and stained for 10 minutes in either carbolized gentian violet or Ziehl's fuchsin.

E. H.

AMOEBIASIS AND DYSENTERY.

Amoebiasis.

Gourvitch (Isaac). Erfahrungen ueber Amöbendysenterie in Tiberias im Jahre 1926. [**Amoebic Dysentery in Tiberias in 1926.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Feb. Vol. 32. No. 2. pp. 62–69.

Dysentery is least common in May; the largest numbers appear at end of year, in November and December. Malaria is also commonest then and the author notes that nevertheless it is very rare to find the two infections in the same patient; he has observed but two cases of combined chronic dysentery and chronic malaria. The great majority of cases of dysentery coming for treatment are apparently first attacks, though some "relapse" cases are encountered. In 3 cases dysentery developed 1 to 3 days after measles—yet during a measles epidemic there were hardly any cases of dysentery. Interesting observations were made on the comparative incidence of dysentery; e.g., among Spanish and Kurdish Jew immigrants it was much more common than among other European-Jewish immigrants. Dysentery was notably of a milder clinical form in the native born. In treatment emetine, yatren and stovarsol gave good results. The author makes it clear that the insanitary habits of the people and the plague of flies readily account for the widespread endemicity of dysentery. [Though this interesting paper purports to deal with *amoebic* dysentery, it nowhere makes it clear or probable that the author was in fact dealing with *amoebic* dysentery. It may safely be prophesied that bacillary dysentery will be shown to be far the commoner in Palestine—a demonstration that has already begun.]

H. M. Hanschell.

Remlinger (P.). Quelques réflexions sur l'amibiase au Maroc et à Fez. [**Amoebiasis in Morocco.**]—*Bull. Soc. Path. Exot.* 1298. Feb. 8. Vol. 21. No. 2. pp. 94–99. [2 refs.]

The matter is passed in review in some detail. The author finds that amoebiasis, formerly non-existent in Morocco, is now very common there. The disease occurs most notably in Fez, the most dysenteric town in North Africa, and equally the favoured terrain of all intestinal parasites, protozoal or helminthic, which often give rise to no obvious symptoms, but sometimes serve to aggravate the symptoms of dysentery, or even to produce a dysentery - syndrome of their own acord; especially is this so with trichomonas and lamblia. The author plainly considers that sanitary matters are now, as they were, extremely insanitary.

H. M. H.

Hutchison (Harry S.). **Observations on Endamebic Dysentery.**—*Jl. Lab. & Clin. Med.* 1928. Apr. Vol. 13. No. 7. pp. 613–621. [20 refs.] [American Mission Hosp., Tanta, Egypt & the Dept. of Path., Western Reserve Univ. & Cleveland City Hosp.]

A careful review of the subject. The author's conclusions are :—

"(1) The correct interpretation of an amebic lesion depends upon a clear recognition of the status which exists between the host and parasite, and the secondary modifying factors which may intervene to obscure the picture.

" (2) The fact that amebic infection exists without symptoms or with very minor symptoms and minor lesions often leads to failure in recognizing cases.

" (3) Recognition of cases without symptoms is possible only through search for cysts in the stool. Experience has taught that even then only positive findings are conclusive, as cysts may not appear in the stool of carriers over considerable periods of time, depending upon the extent of the lesion and whether or not it is progressing or regressing.

" (4) Recognition of cases with dysenteric symptoms consists in the identification of vegetative amebas, precystic forms or cysts in the absence of more obvious etiology.

" (5) The recognition of amebic ulceration depends upon the gross appearance only as it is suggestive ; the final decision rests on finding amebas in the lesions."

H. M. H.

STUART (M. A.). **General Considerations on Amoebic Dysentery and Endamoebic Carriers, from the Viewpoint of a Naval Surgeon.**—*U.S. Nav. Med. Bull.* 1928. Apr. Vol. 26. No. 2. pp. 411–438. [21 refs.]

No new observations nor any recommendations by the author are here recorded. The paper is a careful comprehensive review of the observations of many authors, particularly with reference to American troops and conditions, which have already received notice in this *Bulletin*. The paper, however, is not without value as a reference-compendium for American naval and army surgeons.

H. M. H.

CHUECA (Felipe). Disenteria amebiana en la infancia. [**Amoebic Dysentery in Infants.**]—*Crónica Méd.* Lima. 1928. Jan. Vol. 45. No. 775. pp. 25–36. With 6 charts in text.

Infants and young children are by no means exempt from amoebic infection in Lima. The author analyses 76 cases below two years of age and 22 cases less than six months old. He found the disease even among breast-fed infants, and thinks that infection in some at least was fly-borne. Cases are divided clinically into acute, subacute, chronic and latent (larvada). The last refers to those with slight intestinal disturbances, often referred to teething or some transient digestive upset, which would be overlooked if faecal examinations were not done. The disease in the very young is more serious than in adults ; anaemia is more profound, relapses common, and the mortality is higher. The most satisfactory treatment consists of emetine by injection and arsenicals, e.g., novarsenobenzol, by mouth. For those intolerant of emetine yatren was substituted either by mouth or by rectal injection.

H. Harold Scott.

DEUTSCH (D.). Zur Therapie der Amöbenruhr bei Kindern. [**Treatment of Amoebic Dysentery in Children.**]—*Deut. Med. Woch.* 1927. Feb. 25. Vol. 53. No. 9. pp. 360–362.

The usual doses of emetine recommended for children, 1/12 and 1/20 of that for adults, are, in the author's experience in Palestine, ineffective. He recommends for 6 months old infants doses of 0·01–0·02 gm. ; for one year olds 0·03–0·05 gm., total quantity up to 0·12 gm. ; for yet older

infants up to 0·15 gm.—by injection. Vomiting may result but is not serious. The doses must be smaller for weak infants. Yatren is now established as practically a specific against all forms of dysentery—in 2 per cent. high clyster it is effective for dysentery in children. For bacillary dysentery the value of castor oil is stressed. Calomel is on the whole harmful in children. Other drugs are discussed. Ice per rectum procures quick relief from pain. Finally the matter of diet is fully dealt with.

H. M. H.

LYNCH (Kenneth M.). **Intestinal Amebiasis of the Rat and Man.**—*Southern Med. Jl.* 1928. Feb. Vol. 21. No. 2. pp. 87–91. With 8 text figs. [7 refs.] [Med. College of State of S. Carolina, Charleston, S.C.]

In 1915 the author first published his observations concerning the possibility of the rat being carrier of *Entamoeba histolytica*, based on his successful experimental transmission of infection from man to rat, from rat to rat, and on his discovery also of natural infection of wild rats with an amoeba indistinguishable from *E. histolytica*. These observations have received confirmation by BRUG (1918), KESSEL (1923) and CHIANG (1925) [this *Bulletin* Vol. 22, p. 743].

CHIANG infected white rats with *E. histolytica* of human origin, and proved pathogenicity of amoebae recovered from the rats by rectal injection into kittens, and also discovered in laboratory rats a natural intestinal infection with amoebae morphologically closely resembling *E. histolytica* of human origin.

The author's findings, here carefully described [but not successfully illustrated by the tissue microphotographs], show, as he claims, that the muco-sanguineous colitis of his rats experimentally infected with *E. histolytica* of human origin very closely resembles clinically and in morbid anatomy that of acute intestinal amoebiasis in man.

In his rats found to be naturally infected with an amoeba indistinguishable from *E. histolytica* the intestinal disease is evidently chronic: there may be no ulcers of mucosa; ulcers may be numerous and superficial or few and deeper and more extensive. Amoebae may be found deep in mucosa, or in these ulcers, or only in the lumen in the non-ulcerated type; in fact, as he points out, conforming to the type in man which is coming into recognition as the more common form of intestinal amoebiasis, and is distinct from the rarer acute amoebic dysentery. These rats have formed stools and are outwardly in normal condition.

The author records morphological details in living and stained specimens to show that these amoebas are indistinguishable from *E. histolytica*. [A contention feebly supported by microphotographs of the rat amoeba.]

H. M. H.

FISCHER (Otto). Ueber Amöbenhepatitis. [**Amoebic Hepatitis.**]—*Muench. Med. Woch.* 1927. Oct. 14. Vol. 74. No. 41. pp. 1739–1741. With 6 charts. [4 refs.] [Inst. for Ship & Trop. Diseases, Hamburg.]

The author bases this paper on his observations on a series of cases of affections of liver occurring in the Hamburg Institute for Tropical Diseases. In all cases clinically suggestive of general septic infection

who have recently been, or long dwelt in the tropics, amoebic hepatitis must be considered ; and in all cases emetine must be given. Local symptoms may point to cholecystitis or cholangitis ; icterus, however, is seldom present in amoebic hepatitis. Patients from tropics whose only complaint is pain in right hypochondrium and right shoulder should always be given emetine treatment. The author gives emetine hydrochlor., intravenously ; on the first day 0·05 gm. in 2–3 cc. of physiological salt solution. If this is well tolerated 0·1 gm. is thus given 24 hours later ; and then a like dose every second day until 7 injections have been given. Not more than 1 gm. all told is given; emetine has cumulative effect, and more than this may cause intoxication Actually 0·65–0·7 gm is usually sufficient After a pause of 6–8 weeks the injections may be repeated Besides this emetine course, in cases where no amoebae are found in stools and rectoscopy reveals no changes in mucous membrane, pills of Yatren purissimum 105, 1–3 daily are given for one week. After 2–3 injections of emetine fever and symptoms disappear and there is rapid recovery. The emetine course must be repeated to prevent relapse.

H. M. H.

Bezançon (Fernand) & Bernard (Etienne). Volumineux abcés amibien du foie ouvert dans les bronches ayant par son début simulé une pneumonie et par les vomiques une suppuration pulmonaire.—Interprétation des signes radiologiques.—Guérison par l'émétine et le novarsénobenzol. [**Large Hepatic Abscess. Radiology. Treatment.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1928. Jan. 5. Year 43. 3rd Ser. Vol. 51. No. 38. pp. 1728–1745. With 7 text figs. [15 refs.]

This case is carefully and very fully reported, illustrated, and critically discussed. To summarize further than its title does would be to spoil—for its interest lies in the close comparative valuation of symptoms and physical signs ; and the shadowy data of radiography to be peered at rather than read of.

H. M. H.

Faure-Beaulieu (Marcel). Abcès amibien autochtone du lobe gauche du foie. [**Amebic Abscess of Left Lobe of Liver.**]—*Presse Méd.* 1928. Mar. 3. Vol. 36. No. 18. pp. 283–284.

A male patient, 26 years old, collapsed suddenly with acute abdominal pain and fever ; but abdominal muscles not very rigid and no distention of abdomen. No history of dysentery, no previous residence in tropics ; no amoebae or cysts found in stools. Later tumour felt apparently in left lobe of liver. Exploratory puncture recovered chocolate sterile pus ; no amoebae or cysts found in stools nor in pus. Steady improvement and final apparent cure after emetine therapy.

H. M. H.

Pirot. Abcès du foie guéri par l'émétine. [**Liver Abscess cured by Emetine.**]—*Arch. Méd. et Pharm. Nav.* 1927. Oct.–Nov.–Dec. Vol. 117. No. 4. pp. 330–336.

The patient, a man 23 years old, had had no diarrhoeic attack during 16 months' service in the Far East. He first complained of pain in right shoulder. This continued for 10 days during which there developed pain

over hepatic region, wasting, heavy night sweats and high fever. No icterus ; urine normal. The liver was enlarged and tender. No cysts or vegetative amoebae, and no helminth ova were found in stools. Complete return of liver to normal and disappearance of all symptoms followed on a course of emetine injections. No exploratory puncture was undertaken.

H. M. H.

WIRSSALADSE (S.). Zur Diagnose der Leber- und Subdiaphragmalabszesse. (Neue Beobachtungen.) [**Diagnosis of Liver and Subdiaphragmatic Abscess.**]—*Abhandl. a. d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift NOCHT.] pp. 594–604. [7 refs.] [Hosp. Clinic, Univ., Tiflis.]

The matter is discussed very fully and illustrative cases are reported. The author concludes by declaring that correct diagnosis rests on due attention to and appreciation of history, temperature reaction, feeble septic condition of patient, light icteric tinge of skin, definite leucocytosis, exploratory puncture, and the nature of the material thus obtained, radioscopic findings, presence of fluctuation in liver region, circumscribed tenderness on palpation and percussion—all plain objective symptoms corresponding to pathological-anatomical relations and changes. There should be a painstaking clinical examination of the patient especially to exclude any other possible cause for the fever and illness.

H. M. H.

FIESSINGER (Noel) & CASTERAN (Robert). Le syndrome pleuro-pulmonaire de la base dans les abcès du foie. L'exploration lipiodolée des abcès du foie. Déductions de pathologie générale. [**The Pleuropulmonary Syndrome in Liver Abscess.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1928. Jan. 5. Year 43. 3rd Ser. Vol. 51. No. 38. pp. 1746–1757. With 1 chart & 2 text figs. [4 refs.]

In this paper the authors very fully and critically discuss the subject matter. It is not possible to summarize it fairly. They claim that their observations reveal the importance, and the diagnostic difficulties, of pleuro-pulmonary congestions (right and left—this last complicated by suppurative pericarditis), as early manifestations of a liver abscess which may emerge only weeks or months later : that the amoebic is a " cold " abscess ; that with an enormous abscess fever may disappear in 24 hours after an emetine injection ; that absorption of pus follows slowly ; and that simple puncture-aspiration and emetine therapy can cure huge abscesses.

H. M. H.

GRASSET (E.) & FOURQUIER (G.). Sept cas d'amibiase pulmonaire en un an et demi dans une localité de la banlieue parisienne. [**Seven Cases of Pulmonary Amoebiasis seen in 1½ Years in a Parisian Suburb.**]—*Bull. Acad. Méd.* 1928. Mar. 18. Year 92. 3rd Ser. Vol. 99. No. 11. pp. 345–349.

The authors suggest that pulmonary amoebiasis is endemic in France, though unrecognized ; and in support record briefly seven cases of middle-aged patients, two of whom had been in the tropics, and one of

these had definitely had dysentery in the tropics ; all suffered for periods of months or years from bronchitic or other pulmonary syndrome with coughing up of blood-stained muco-purulent sputa, in which no tubercle bacilli were demonstrated, but in which the authors readily found many amoebae. They particularly note that the sputa must be examined fresh and warm ; then amoebae are often so numerous, in clumps or scattered, as to constitute 60 to 70 per cent. of the cellular elements. These amoebae contained erythrocytes and sometimes bacteria, were motile and displayed well marked hyaline pseudopodia. All these cases improved greatly or were cured by emetine or treparsol. In a footnote BRUMPT considers that these observations do not in fact establish these amoebae as *Entamoeba dysenteriae* (*E. histolytica*). This can be done only by morphological study after special staining and above all after intra-rectal inoculation into kittens.

H. M. H.

VIALARD & PAPONNET. Un cas d'amibiase pulmonaire pure à rechute définitivement guéri par l'émétine, le stovarsol et le tréparsol. [**Case of Pulmonary Amoebiasis cured by Emetine, Stovarsol and Treparsol.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1928. Mar. 15. Year 44. 3rd Ser. Vol. 52. No. 9. pp. 452–456.

A male 29 years old, serving on the Yangtse Kiang, suffered from muco-sanguineous diarrhoea, *E. histolytica* being found in the stools. On this and two subsequent occasions he recovered under hypodermic or intravenous injections of emetine. Later he had a sudden attack of severe stabbing pain under right nipple with rigors, sweats, dyspnoea and fever ; three days later cough and blood-stained sputa. No enlargement or tenderness of liver or spleen, normal stools. He received emetine injections intravenously. A few days later examination of bloody sputa revealed no Koch's bacilli, no amoebae, no spirochaetes. Radioscopy showed mobile diaphragm, and a dark shadow at base of right lung. Intravenous emetine injections procured apparent cure—but the symptoms recurred. Again search in sputa gave negative results, and " cure " this time was procured by intravenous injections of emetine followed up by a course of tréparsol. Patient has remained well for 3 years.

H. M. H.

LEMIERRE (A.) & KOURILSKY (R.). Un cas d'abcès amibien du poumon confondu aved une pleurésie interlobaire et guéri par l'émétine. [**Case of Amoebic Abscess of Lung with Pleurisy cured by Emetine.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1928. Jan. 26. Year 44. 3rd Ser. Vol. 52. No. 2. pp. 56–67. With 3 text figs. [8 refs.]

The case is described in the fullest possible detail. The physical signs, symptoms, and their differential diagnosis are critically discussed, and at great length.

There was no history suggesting any form of amoebiasis in the patient's past, nor any actual signs of its presence then. The authors based their diagnosis of *amoebic* abscess of lung on the two facts only : (1) that aspiration recovered a-microbic (sterile) pus, and (2) the case improved and was eventually pronounced cured after a course of emetine injections. Neither pus nor sputa revealed amoebae.

H. M. H.

HABERFELD (Walther). Bronchitis und Peribronchitis amoebiana. [**Bronchitis and Peribronchitis Amoebiana.**]—*Muench. Med. Woch.* 1927. Oct. 28. Vol. 74. No. 43. pp. 1834–1835.

Besides other extra-intestinal invasions by amoebae, that of the lung is now well known ; either by extension from liver abscess, or rupture of liver abscess into lung ; or by metastatic extension into lung. Amoebic bronchitis, or rather peribronchitis, resembles clinically tuberculosis, or the broncho-spirochaetosis of Castellani.

The author describes in full detail the case of a 23 year old patient, with cough and blood-stained sputa lasting for 12 years, in whom no dysentery or disease of liver or intestines had ever been noted. All tests for syphilis, tuberculosis, bronchitis of Castellani, and blastomycosis repeated during many years had always been negatvie. During an attack of fever with pleuritic pain an operation for empyema was carried out. Later X-ray showed dilatation of the smaller bronchi. Finally the author demonstrated in the fresh sputa characteristic amoebae. They did not contain erythrocytes, and no cysts were found. The possible routes of infection are discussed. Probably this was a case of inhalation infection. The amoebae vanished from the sputa, and the patient's condition was cured after treatment with emetine.

H. M. H.

TRABAUD. Les formes cérébro-méningées de l'amibiase. [**Cerebromeningeal Forms of Amoebiasis.**]—*Rev. Prat. Malad. des Pays Chauds.* 1927. Nov. Year 6. Vol. 7. No. 11. pp. 550–557.

Five cases are briefly described whose symptoms and physical signs suggested in some cases acute meningitis only, in others the involvement of brain as well. The "meningitis" cases, however, had quite normal cerebrospinal fluid : instead, they either had had dysentery, or amoebae or cysts were found in the stools, or condition improved after emetine therapy. [The evidence here reported, and not too briefly yet seriously discussed and proclaimed by the author, for an *amoebic* origin of, or influence on, these syndromes could hardly be more flimsy.]

H. M. H.

BA CHOW (J.). **A Case of Chronic Amoebic Infection, especially affecting the Vermiform Appendix.**—*Indian Med. Gaz.* 1928. Feb. Vol. 63. No. 2. p. 82.

A male, 26 years old, emaciated, with oedema of feet and frequent diarrhoeic stools. Lavage through caecostomy was decided upon. The vermiform appendix was found thickened and adherent and was removed. A faecal mass at its tip and its lumen filled with muco-pus containing numerous active amoebae, here called *E. histolytica*, though repeated examination of stools had revealed no amoebae. Recovery with formed stools.

H. M. H.

DAVEY (J. B.). **Sporadic Case of Amoebic Dysentery.** [Miscellanea.]—*Ann. Trop. Med. & Parasit.* 1927. Dec. 31. Vol. 21. No. 4. p. 479.

A man, aged 60 years, for 26 years an employee at a sewage farm, suffered for 4 months from diarrhoea ; no pain ; blood and mucus in stools.

Abdominal *and sigmoidoscopic* examination revealed nothing abnormal, nor did X-ray after barium enema. The microscope revealed in the faecal mucus red blood cells and many motile amoebae containing many r.b.c.s with clear pseudopodia, but ill-defined differentiation between endo- and ecto-plasm. No cysts. No non-lactose-fermenting coliform organisms recovered on plating out stool. After two courses of bismuth-emetine-iodide no amoeba or cysts were found in stools. This patient had never been out of England and no source of infection could be found in his household. His occupation, the author thinks, suggests the source of infection.

H. M. H.

CHEREFEDDIN (Osman). Amöbennephritis und Lungengangrän. [**Amoebic Nephritis and Gangrene of Lung.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1927. Nov. Vol. 31. No. 11. pp. 526–529.

The author states that after the Armistice and occupation of Constantinople by " Entente " troops, an epidemic of amoebic dysentery occurred. Its origin was probably from " carriers " among the multi-coloured troops of occupation—Indians, Chinese, negroes. In addition many Turks from war prisoners' camps in India and Egypt arrived infected with amoebic dysentery. This disease has since then been endemic in Constantinople ; many complications—liver abscess, pleurisy empyema, rupture of liver abscess into peritoneal cavity, amoebic appendicitis, perforation of intestine, pericolitis—have been noted. Recently the author has found in addition brain abscess, gangrene of lung and pyelonephritis. Reference is made to the cases of amoebic pyelonephritis described by PETZETAKIS in Alexandria. Clinical descriptions are given of two typical cases of the author's ; in neither had there been any previous dysentery.

The symptoms were lumbar pain, fever, and urine containing albumin leucocytes, red blood cells, few casts. X-ray showed no stone, and tubercle was excluded by guineapig inoculation. Cystoscopy revealed only slight inflammation of bladder. In urine obtained from ureter were typical amoebae, many containing red blood cells. Other cases but with previous dysentery have been observed. All got well after treatment with emetine alternating with spirocid ; other therapy had failed. Finally the author describes a case in which physical signs, symptoms and X-ray findings, led to a diagnosis of abscess or gangrene of lung. The patient's stools contained blood and mucus in which were typical amoebae ; amoebae were found also in the sputa. Symptoms and physical signs and amoebae disappeared and the patient was restored to health after emetine treatment.

H. M. H.

VAN CUTSEM-FRANCO (Alberto). Un cas d'amibiase urinaire. [**Case of Urinary Amoebiasis.**]—*Bruxelles-Méd.* 1928. Mar. 25. Vol. 8. No. 21. pp. 711–712.

A child 4½ years old, in Kambove, Katanga, Congo Belge, was found to be passing scanty bloodstained urine. No pain, no icterus, and otherwise not suffering. Three specimens of urine, all equally bloody, indicated the kidney as source of the haemorrhage.

The microscope revealed, besides numerous erythrocytes, some granular and hyaline casts, a few crystals and epithelial cells and many granular cells about 30μ diameter, exactly resembling " Amoeba Loeschia histolytica " in the precystic stage. Some of these " amoebae " contained red blood cells ; they were never seen to be motile.

The child's urine returned to normal after emetine therapy. The stools did not reveal any amoebae. Two years previously there had been an attack of dysentery.

H. M. H.

ROCCA (Giuseppe Cascio). Un caso di cistite da *Entamoeba histolytica.* [**A Case of Amoebic Cystitis.**]—*Riforma Med.* 1928. Mar. 26. Vol. 44. No. 13. pp. 346–348. [27 refs.] [Hyg. Inst., Univ., Palermo.]

A man, 31 years, suffered in 1917 from an attack of dysentery. Three years later his urine became turbid, sometimes of a reddish colour. This symptom continued off and on till 1924 when examination of the urinary sediment revealed Entamoeba, both vegetative and cystic, and cystoscopy showed a mild degree of cystitis. Emetine benefited greatly both dysentery and urinary trouble, but in December, 1927, faeces still contained vegetative and cystic forms of Entamoeba, the former persisting in the urine.

H. Harold Scott.

PETER (F. M.). Rivanol in der Behandlung der Amöbendysenterie. [Erste Mitteilung.] [**Rivanol in the Treatment of Amoebic Dysentery.**]—*Muench. Med. Woch.* 1927. Oct. 7. Vol. 74. No. 40. pp. 1709–1711. [3 refs.] [Works Hosp., Surinam Bauxite Co., Moengo, Dutch W. Indies.]

The author's attention was drawn to solution of rivanol in rectal clysma, in treatment of dysentery by URCHS (1926) [see this *Bulletin*, Vol. 24, p. 363.] Dr. Peter now gives a lengthy account and discussion of a small series of cases in adults, children, and babies, of dysentery clinically and microscopically amoebic in origin treated by rivanol solution 1-10,000 in rectal clysmas, 3–4 daily for 3–4 days. In every case the rivanol clysma was followed by rapid fall of fever, disappearance of pain, tenesmus, and blood and slime in stools, return of stools to normal faeculent consistency, and recovery of appetite and general health. After two to three days of this treatment vegetative and encysted forms of *Entamoeba histolytica* had disappeared from the stools. In one case in which rivanol 1-5,000 was tried spasmodic contraction of the colon resulted. URCHS had claimed rivanol to be effective only against symptoms and the secondary infection of the specific ulcers. The author, however, claims for it direct action on the amoebae and, as well, a sedative and anaesthetic action on the inflamed and irritated gut. He noted that JOSEPH found it to have anaesthetic action on the bladder, and that BUESSING procured relief from pain in gonococcal epididymitis by injecting rivanol solution. The author has no doubt that rivanol has now been shown to be a gratifying and valuable addition to the medical armamentarium.

H. M. H.

BETEAU (J. P.). Note sur la thérapeutique antiamibienne. [**Treatment of Amoebiasis.**]—*Rev. Méd. et Hyg. Trop.* 1928. Mar.–Apr. Vol. 20. No. 2. pp. 45–47.

This note recounts success in treating amoebic dysentery by intramuscular injections of a compound of bismuth and arsenic iodides, Trio-Iodo Ercé (Laboratoires Robert et Carrière). It is also claimed that this drug is equally efficacious in malaria.

H. M. H.

CRAIG (Charles F.). **Complement Fixation in the Diagnosis of Infections with** *Endamoeba histolytica.*—*Amer. Jl. Trop. Med.* 1928. Jan. Vol. 8. No. 1. pp. 29–36. [3 refs.] [Army Med. School, Washington, D.C.]

The author had already described occurrence of haemolytic and cytolytic substances in alcoholic extracts of *Entamoeba histolytica*, which, used as antigens in tests with sera of persons infected with this parasite, revealed complement fixation, while negative results were obtained with sera of persons not infected with the parasite [*ante*, p. 228].

In this paper he gives full details of his further work on this phenomenon which is yet put forth only as a preliminary contribution. His conclusions may be given :—

(1) In blood serum of persons infected with *E. histolytica* there occur complement fixing (C.F.) bodies which can be demonstrated by using as antigen alcoholic extracts of cultures of this parasite.

(2) The C.F. reaction disappears in *E. histolytica* infected cases after treatment has eliminated that parasite.

(3) Persons not infected with *E. histolytica* do not give a positive C.F. reaction when their blood serum is tested with such extracts of the parasite.

(4) The reaction does not occur in individuals infested with *E. coli*, *E. nana*, *Iodamoeba williamsi*, *Trichomonas hominis*, or *Chilomastix mesnili*. Probably, therefore, there is no positive reaction in other protozoan infections, when such extracts are used as antigens.

(5) The reaction does not occur in persons suffering from other infections or diseases.

(6) The reaction does not occur in persons giving a positive Wassermann or Kahn reaction unless *E. histolytica* is present.

(7) The reaction occurs not only in those presenting definite symptoms of *E. histolytica* infection, but also in those with mild indefinite symptoms, and in " carriers " with no symptoms of the infection.

(8) The practical diagnostic value of this test is still uncertain because of the difficulty in securing suitable antigens and the technical difficulties of the test ; moreover nearly every case giving a positive reaction can be diagnosed by microscopical examination of faeces, or of cultures of the organism from the faeces.

H. M. H.

ALEXEIEFF (A.). Remarque à propos du mémoire de A. W. Sellards et W. A. Baetjer (1927), the Occurrence of Atypical Amoebiasis. (*Parasitology*, xix. 48–53, Plate I.) [**Remarks on Sellards and Baetjer's Paper on " The Occurrence of Atypical Amoebiasis."**]—*Parasitology*. 1927. Sept. Vol. 19. No. 3. pp. 333–334. [1 ref.]

This paper describes briefly the plasmophage (macrophage) originating from Unna's plasma cell and its development and varying morphology. It has often been confused with *E. histolytica*, for example by SCHAUDINN, HARTMANN, BRUMPT, and SELLARDS and BAETJER. On the other hand, J. Gordon THOMSON (1926) has correctly distinguished and described this macrophage. [SELLARDS and BAETJER'S paper was noticed in this *Bulletin*, Vol. 24, p. 787.]

H. M. H.

Bacillary Dysentery.

Perry (H. Marrian) & Bensted (Harold J.). *Bacillus dysenteriae* **Sonne as an Aetiological Agent of Dysentery in Egypt.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1928. Feb. 25. Vol. 21. No. 5. pp. 417–420. [6 refs.] [Public Health Lab., Cairo.]

The careful record of a series of cases of enteritis and entero-colitis in children and adults in Egypt from which the *Bact. dysenteriae* Sonne was isolated. The organism recovered corresponded biochemically and serologically with the classical strains isolated by Sonne. It is not suggested that this organism is more than one of the bacillary agents responsible for intestinal infections of this type, prevalent in Egypt during the warm season, but it is of importance to note that it was the only aetiological agent isolated from 35 to 40 per cent. of a series subjected to careful investigation.

H. M. H.

Sardjito (M.). Een dysenterie-epidemie, veroorzaakt door de bacillen van Shiga-Kruse in Moearadoewa, Afdeeling Rangkasbetoeng, Residentie Banten. [**A Dysentery Epidemic caused by Shiga-Kruse Bacilli.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1928. Vol. 68. No. 1. pp. 68–79. With 2 diagrams. [4 refs.] [Med. Lab., Weltevreden, Java.]

——. **A Dysentery Epidemic caused by the Bacilli of Shiga-Kruse in Moearadoewa, District of Rangkasbitoeng, in the Residency of Bantam.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1928. Vol. 17. Pt. 1. pp. 52–62. With 2 diagrams & 5 figs. on 3 plates. [4 refs.]

Among the instructions issued to the author for dealing with the epidemic were: (1) that half the affected population were to be inoculated with prophylactic vaccine, (2) that stools of both inoculated and controls were to be examined with a view to detection of infection before symptoms were manifest. The transmission of infection was regarded as due probably to contact infection and not to water or to flies. In the course of the investigation the possibility of isolation of Shiga bacilli from Endo plates, which had been sown 4 days previously with faecal test material, was shown. A suggestion is made that by this means bacteriological examination may be conducted at the nearest laboratory without the necessity of despatching a bacteriologist in person to a district affected by epidemic.

The vaccine (Sardjito, this *Bulletin*, Vol. 24, pp. 27; 372) contained 500 million Shiga bacilli lysed by bacteriophage, 1,500 million ordinary Shiga bacilli and the same numbers of atoxic dysentery bacilli per cc., and was sterilized with 1 per cent. formalin. The selected dose for an adult was 1·5 cc. Neutralization of the vaccine with sod. hydroxide was necessary before use, as the formalin gives rise to considerable pain on injection. Children bore the vaccination well and 103 individuals in all were vaccinated. Unfortunately the epidemic came so quickly to an end that no indication was furnished of the success of the trials of vaccine.

W. F. Harvey.

MANDRY (Oscar Costa). **Bacteriological Study of Dysentery in Porto Rico. A Preliminary Report.**—*Porto Rico Rev. of Public Health & Trop. Med.* 1928. Jan. Vol. 3. No. 7. pp. 259–266. With 1 chart.

The author's summary of his interesting paper is to this effect :—

(1) Though vital statistics show that "diarrhoea and enteritis" cause more deaths in Porto Rico than any other group of diseases, the number of deaths attributed to either bacillary or amoebic dysentery is comparatively small. A more thorough clinical and laboratory study of this large group of infections is needed.

(2) A bacteriological study of the stools in seventy-seven cases of acute diarrhoea revealed the Flexner type bacillus in six, but no other dysentery-group organism (one of the cases proved fatal).

(3) Examination of stools from seventy-two controls revealed no dysentery bacillus carriers.

(4) Other organisms, including *B. paratyphosus B* ; *B. enteritidis* ; *B. suipestifer* ; of possible import in intestinal disorders, were found in both the diarrhoeal and non-diarrhoeal (control) cases.

H. M. H.

SEVERN (A. G. Millott) & EVANS (Ewart W.). **A Localised Outbreak of Bacillary Dysentery in Smethwick.**—*Lancet.* 1928. Jan. 21. pp. 126–127.

One case of dysentery in Smethwick had been reported in 1924 ; and since 1919 only 20 cases in a local population of over 75,000. The outbreak in July–August, 1927, here recorded, was limited to families residing on the first and second floors of a tenement house. There were ten cases, no deaths. The common source of infection was traced to the water supply—contained in an iron tank. Only women and children were affected ; presumably the men took their liquid refreshment outside their homes. Dysentery bacillus of Flexner type was isolated from the stools of five of the patients. From stools of one man in these family groups a Flexner bacillus was isolated. He was in apparent good health, but had suffered from dysentery in Salonica in 1918. How this carrier had contaminated the water in the tank was not determined.

H. M. H.

BÜCHNER (S.). Untersuchungen ueber die Verbreitung der Ruhr im Kindesalter. [**Range of Dysentery in Childhood.**]—*Jahrb. f. Kinderheilk.* 1928. Jan. Vol. 118. (3rd Ser. Vol. 68). No. 5-6. pp. 285–295. [8 refs.] [Univ. Child. Clinic, Münster.]

An interesting record of a series of cases carefully observed. Out of 160 cases of clinical or suspected dysentery in children bacillary dysentery was proved bacteriologically or serologically in nearly one half of the cases over 6 months in age, and in nearly all of those over two years in age. By culture methods dysentery bacilli were demonstrated in one-third of the cases over 6 months old, and in over half of those over two years in age. Bacillary dysentery plays an important part in the disturbances of nutrition of children. In 166 children with apparently healthy intestines, the blood serum of four-fifths of those over one year old, and of 90 per cent. of those over 6–13 years old, agglutinated dysentery bacilli. This points to the possibility of there

being infection with dysentery bacilli without any concomitant symptoms of dysentery. In two infants at breast showing dysentery symptoms paratyphus A bacillus was isolated.

H. M. H.

PACHECO (Genesio). Modification de la méthode permettant d'établir le diagnostic de la dysenterie bacillaire en vingt-quatre heures. [**A Method of establishing the Diagnosis of Bacillary Dysentery in 24 Hours.**]—*C.R. Soc. Biol.* 1928. Mar. 2. Vol. 98. No. 8. pp. 633–634. [1 ref.] [Oswaldo Cruz Inst., Rio de Janeiro, Brazil.]

The author promises a further communication giving more details of procedure and interpretation of results. Meanwhile he records here that Andrade is the best indicator. This in acid solution of 1 in 500,000 gives a plain rose tint. It is not, moreover, reduced by bacteria. He has also found Haffer's catalase test useful. With Shiga bacillus it is always negative, with the other dysentery bacilli always positive. The test consists in adding oxygenated water to a fresh bouillon culture; a positive result is shown by formation of gas bubbles.

H. M. H.

MONTEL (L. R.). Administration du sérum antidysentérique *per os* et en lavements dans le traitement de la dysenterie bacillaire. [**Administration of Antidysenteric Serum by Mouth and by Rectum.**]—*Bull. Soc. Path. Exot.* 1928. Jan. 11. Vol. 21. No. 1. pp. 16–18. [2 refs.] [Polyclinic, Saïgon.]

Several years' experience has convinced the author of the quicker beneficial results that follow rectal clysters of antidysenteric serum and giving the serum by mouth, instead of by the usual subcutaneous injection. The clysters should be preceded by an evacuant alkaline lavage of the bowel. In particular he has noted cessation of tenesmus after the first serum-clyster.

H. M. H.

KNAUER (H.). Serumtherapie bei kindlicher Ruhr. [**Serum Therapy in Dysentery of Children.**]—*Muench. Med. Woch.* 1926. Nov. 12. Vol. 73. No. 46. pp. 1924–1926. [8 refs.]

The author gives a general review of his experience during four years in the treatment of dysentery in infants and children with antidysentery serum. The infections, established bacteriologically, were Y bacillus, Flexner, Shiga-Kruse and Gärtner; the best results with the antidysentery serum were obtained in Y infections. The author insists that the doses of serum should be large. Intramuscular injections are painful and intravenous injections require assistance. He has given the serum intraperitoneally with no untoward results, but with great benefit to the patient in doses from 100 to 300 cc. These may be repeated daily. The injection procures rapid decrease of toxaemia; improvement in stools takes longer to appear; if delayed long, he has found benefit follow treatment by a vaccine. Dieting is a necessary

and important part of treatment. Sometimes vaccine has been given as an after treatment with good results. The mortality in serum treated cases was 30·4 per cent., that in cases without serum 42·9 per cent.

H. M. H.

VAZ (Eduardo). Contribuição ao tratamento da dysenteria bacillar. [**The Treatment of Bacillary Dysentery.**]—*Brasil-Medico.* 1928. Mar. 24. Vol. 42. No. 12. pp. 320–326.

The author briefly records 18 cases in support of his plea for the early and intensive use of polyvalent vaccines for treating bacillary dysentery. He records wonderful results attained even before the time usually needed to establish a diagnosis. One example will suffice: A man gave a history of passing frequent stools with blood and mucus accompanied by tenesmus and colic, for eight days. He was given 80 cc. of vaccine by mouth in the course of 8 hours. The symptoms disappeared, but 40 cc. more were given on another day "to consolidate the cure"—which was complete by the time the organism was identified.

H. Harold Scott.

IONESCO-MIHAIESTI (C.) & DAMBOVICEANU (A.). Recherches sur la résistance des toxines diphtérique et dysentérique aux différentes concentrations en ions hydrogenes. [**Resistance of Diphtheria and Dysentery Toxins to Varying Hydrogen Ion Concentration.**]—*Arch. Roumaines Path. Experim. et Microbiol.* Paris. 1928. Jan. Vol. 1. No. 1. pp. 115–121. [10 refs.] [Lab. of Experim. Med., & Serotherap. Inst., Bucharest.]

Stabilized toxins in bouillon which had been kept in ice for some months under toluol were used. The final reaction of the diphtheria toxin was pH7·9 and that of dysentery pH8·1. For the experiments the toxins were diluted with buffer solutions of varying pH. These buffer solutions were themselves tested for their toxicity between the limits pH3·5 and 10·01. The extreme alkaline solutions gave rise in guineapigs to a pronounced oedema which disappeared in 36 hours, while the extreme acid solutions produced a necrosis which disappeared in 7 or 8 days.

1. The experiments showed that the action of H or OH ions is not immediate on the diphtheria toxin. If the diphtheria toxin dilutions were inoculated 30 minutes after preparation, the toxic action was unaltered between the limits of pH 4·7 and pH9·6, as shown by the deaths of the animals. When inoculated 24 hours after preparation toxicity contracted to within the range pH5·7 to pH9.

2. In the case of dysentery toxin a certain length of time of action was also required for the destructive action of H or OH ions. A 30 minutes interval to time of use showed little or no alteration of toxic effect within the range pH2·07 and pH11. After 24 hours it was found that toxic action was lost between pH2·5 and pH3·0, but unaffected for the rest of the range. No limit was found on the alkaline side at which destruction of toxin took place.

The conclusion is drawn that diphtheria toxin is much more easily destroyed than dysentery toxin, and that this seems to indicate an essential difference in their chemical composition.

W. F. Harvey.

BERDNIKOV (A.). Sur la marche de la protéolyse dans les cultures des bacilles dysentériques. [**The Course of Proteolysis in Dysentery Cultures.**]—*C.R. Soc. Biol.* 1928. Jan. 27. Vol. 98. No. 3. pp. 210–211. [4 refs.] [Pasteur Inst., Paris.]

A table is given of the proteolysis determined by various dysentery bacilli in terms of nitrogen, expressed as a percentage of the total nitrogen in the bouillon culture. The quantity of proteids giving a biuret reaction diminishes proportionately to the diminution of virulence of the type of dysentery organism, Shiga, Flexner, or Y, whilst nitrogen under the form of polypeptid, amino-acid, or amino-base, and volatile nitrogen increases. This is equivalent to saying that increase in the proteolytic power of a dysentery bacillus is highly correlated with decrease in its toxic power. It would indicate that saprophytic character is allied to the acquirement of higher proteolytic power.

W. F. Harvey.

MORIN (H. G. S.) & GUILLERM (J.). Principe lytique anti-Shiga de certaines eaux de Cochinchine. [**Anti-Shiga Lytic Principle in Certain Waters of Cochin China.**]—*C.R. Soc. Biol.* 1928. Mar. 2. Vol. 98. No. 8. pp. 575–576. [5 refs.] [Pasteur Inst., Saigon.]

The filtrate of the test water was added to a culture of a type strain of the Shiga bacillus obtained from the Paris Pasteur Institute, to demonstrate the occurrence of lysis. Serial transmissibility of the lytic effect was shown with those waters which contained bacteriophage. The results were negative for the waters of Cai-Cau and Trang-Bang, positive for Rach-Gia and Mekong, with the respective salinities of 0·017, 0·563, 0·073, and 1·217 gm. per litre.

W. F. Harvey.

ARISAWA (T.). Ueber einen neuen Nährboden für die Isolierung der Typhus-, Paratyphus- und Dysenteriebacillen. [**A New Medium for Isolation of Typhoid, Paratyphoid and Dysentery Bacilli.**]—*Fukuoka-Ikwadaigaku-Zasshi* (*Fukuoka Acta Med.*). 1927. Mar. Vol. 20. No. 3. German summary pp. 22–23. [In Japanese.] [Med. Faculty, Imperial Univ., Fukuoka.]

The medium has the composition : 3 per cent. nutrient agar of pH 7·3, 100 ; chemically pure lactose 1 ; 5 per cent. alcoholic pyoctanin blue 0·1 ; 10 per cent. sod. sulphite 5 ; 2 per cent. metachrom yellow 3. If the metachrom yellow is omitted, there is no effect produced upon the development of typhoid and paratyphoid bacilli, whilst that of colon bacilli is rather inhibited and dysentery bacilli do not grow at all. With the addition of the metachrom yellow no inhibition of the growth of dysentery bacilli occurs. Lactose fermenters give whitish violet colonies and non-lactose fermenters yellowish. Air organisms do not grow well on this medium.

W. F. Harvey.

RAMALHAO (Carlos). Bacille para-dysentérique isolé d'un cas grave et mortel de dysentérie bacillaire. [**A Paradysentery Bacillus from a Fatal Case of Dysentery.**]—*C. R. Soc. Biol.* 1928. Apr. 27. Vol. 98. No. 13. pp. 1167–1168. [Bact. Lab., Faculty of Med., Oporto.]

The organism was isolated in 1920. It was gram-negative, scarcely motile, non-liquefying; it coagulated and acidified litmus milk, gave a positive indole reaction and fermented lactose, glucose and saccharose; agglutination occurred at 1–100 with Shiga serum and at 1–300 with Flexner serum; it produced an abscess only on subcutaneous injection in the rabbit. The serum prepared to this organism agglutinated it at 1–1,200, but did not agglutinate *Bact. dysenteriae* (Flexner), *Bact. dysenteriae* (Shiga), or *Bact. coli*. The preserved culture has been used along with those of Shiga and Flexner in current routine diagnosis of suspected dysentery.

W. F. Harvey.

MAYEDA (Inashire). [**On the Influence of Bivalent Metallic Salts against the Pathogenic Bacteria. II. Experiments with** *Bacillus dysenteriae* **Shiga.**]—*Kei-O-Igaku* (*Jl. Kei-O-Med. Soc.*). 1927. Mar. Vol. 7. No. 3. [Summarized in *Japan Med. World.* 1927. Oct. 15. Vol. 7. No. 10. pp. 305–306.]

Shiga dysentery bacilli cultivated in medium containing bivalent metallic salts for 60 generations showed morphological changes, weaker immunological reactions than the original strain, and diminished protective power against the original strain. Their toxicity, however, was equal to that of the original strain.

W. F. Harvey.

INOKUCHI (Kiyoshige). [**Studies on the Immunological Characteristics of the Medium and Bacterial Sediments of the Shiga Dysentery Bacillary Vaccin. II.**]—*Tokyo Igakkwai Zasshi* (*Jl. of Tokyo Med. Soc.*). 1927. Sept. Vol. 41. No. 8. [Summarized in *Japan Med. World.* 1928. Feb. 15. Vol. 8. No. 2. p. 42.]

Broth culture medium, freed from the bodies of Shiga dysentery bacilli is more effective in immunization than the bacilli themselves. The bactericidal power of a serum obtained by the use of this broth medium as antigen was greater and remained potent for a longer time than that furnished by injection of bacillary bodies.

W. F. Harvey.

VAZ (Eduardo). Da importancia da technica de preparo da vaccina anti-dysenterica. [**On the Importance of the Technique in the Preparation of the Anti-Dysenteric Vaccine.**]—*Rev. Biologia de Hyg.* São Paulo. 1927. Vol. 1. No. 2. pp. 65–74. English summary pp. 74–75. [9 refs.] [Butantan Inst., S. Paulo, Brazil.]

The dysentery vaccine referred to is a Shiga vaccine and the mode of administration *per os*. Cultures in liquid media show almost no toxicity. Their immunogenic power is better with bouillon culture than with cultivation in peptone water. Good aeration of cultures is essential. Filtrates are found to be as good, or better, for immunization as whole cultures. The vaccine is prepared by cultivation for 3 weeks of several strains of Shiga bacilli, whose immunogenic power has been tested on rabbits, in bouillon of pH 7·8. Sterilization is effected by 2·5 per cent. formalization.

W. F. Harvey.

POWELL (L.). Du mecanisme de la vaccination anti-dysentérique par voie buccale. [**Mechanism of Immunity developed by Oral Anti-dysenteric Vaccination.**]—*C.R. Soc. Biol.* 1928. Feb. 10. Vol. 98. No. 5. pp. 350–351. [Pasteur Inst., Paris.]

Rabbits were immunized *per os*, first with killed cultures and then by living virulent cultures. The minimum lethal dose was one agar culture and they were enabled to withstand two cultures. The blood, which had agglutinated before treatment at 1 in 10, had its titre raised to 1 in 200 to 300 and remained at this level for a month. When a comparison was made of the protective power of rabbit serum on mice, which received on the day following the serum a subcutaneous injection of 1-50th part of dysentery agar culture, it was found that the immune serum protected 75 per cent. and a normal serum 40 per cent. The author concludes from the comparatively small difference of protection that the mechanism of oral immunization in rabbits is not to be ascribed to antibodies in the blood.

W. F. Harvey.

BLANC (Georges) & CAMINOPETROS (J.). Recherches expérimentales sur la vaccination antidysentérique chez l'homme. [**Experimental Antidysenteric Vaccination in Man.**]—*C.R. Acad. Sci.* 1927. Dec. 27. Vol. 185. No. 26. pp. 1625–1627. [1 ref.]

Animal experimentation has the disadvantage in dysentery that animals are very sensitive to dysentery toxin but are not susceptible of infection. Therefore such experiments are, to that extent, inconclusive for the case of man. The authors have definitely adopted trials in the human subject, in which comparison is made between oral administration of vaccine, subcutaneous inoculation of killed organisms, subcutaneous inoculation of living organisms and controls receiving no prophylactic treatment. Both Shiga and Flexner dysentery organisms were used. Those who underwent oral treatment were given 4 doses of either 5 cc. of a thick suspension of killed bacilli or 10 cc. to 30 cc. of dysentery toxin at 8 to 10 day intervals, while those subcutaneously injected received 5 to 6,000 million organisms, at the same intervals. The test of the efficacy of the vaccination procedure consisted in the ingestion of living cultures of Shiga or Flexner bacilli 25 days after the last prophylactic dose. The results were, in the following order for orally treated, subcutaneously injected with killed bacilli, subcutaneously treated with living bacilli and untreated :—

(1) Shiga.—8 attacked with dysentery out of 13, 5 out of 8, none out of 13, and 7 out of 10.

(2) Flexner.—1 dysentery out of 1, 2 out of 2, none out of 7, and 1 out of 1.

The numbers are small but, so far as they go, are greatly in favour of the subcutaneous injection of living Shiga or Flexner organisms. The conclusion drawn is that the inoculation of living organisms is innocuous and efficacious, innocuous for the individual receiving the injection and innocuous in the sense that there is no danger of producing dysentery carriers.

W. F. Harvey.

BERSENIEFF (A. P.). Vaccination par voie buccale contre les colites. [**Oral Vaccination against Colitis.**]—*C.R. Soc. Biol.* 1928. May 4. Vol. 98. No. 14. pp. 1179–1180. [Microbiol. Inst., Ivanovo-Voznesensk, Russia.]

A mixed vaccine, in which the organisms were killed by formalin of concentration 0·02 per cent., was used in the course of an epidemic of colitis. It has the composition per cc. of 50,000 million *Bact. coli* and *Prot. vulgaris* and 50,000 million of the dysentery bacilli of Shiga, Flexner, and Hiss. This was administered fasting on three days in succession. The results obtained were that out of 239 vaccinated only one case of simple diarrhoea occurred and one case of mucous diarrhoea, while out of 123 unvaccinated there occurred 4 cases of simple diarrhoea, 9 of mucous diarrhoea, and 4 of haemorrhagic diarrhoea.

W. F. Harvey.

MIXED AND UNCLASSED DYSENTERY.

DE CASTRO (A. Bayley) & DEUSKAR (V. N.). **Some Observations on Dysentery in Port Blair, Andaman Islands.**—*Indian Med. Gaz.* 1927. Dec. Vol. 62. No. 12. pp. 667–675. With 7 charts. [9 refs.]

This long paper gives full details of a careful investigation. It is illustrated by tables and graphs recording incidence and mortality; clinical and autopsy records are quoted; and malaria and rain charts are given. In 1926 the authors dealt with amoebic dysentery 29 cases and three deaths; amoebiasis (intestinal, without dysentery or diarrhoea) 15 cases, 2 deaths; acute bacillary dysentery 63 cases, 4 deaths; chronic bacillary dysentery 8 cases, 2 deaths; colitis 80 cases, 1 death; diarrhoea 15 cases, no death; acute gastro-enteritis 1 case, 1 death. They stress the occurrence of amoebic ulcerative lesions of gut over long periods of time without manifestation of symptoms or inconvenience to the patient. Their cases of amoebic dysentery were in much higher proportion (40 per cent.) to bacillary than that estimated for India. They found a decided tendency to seasonal prevalence of amoebic dysentery similar to that for bacillary: the only reasonable explanation is the marked increase of fly population during these months. Comparative observations lead them to conclude that intravenous injection of emetine has no advantage over hypodermic injection in causing amoebae to disappear from stool more quickly or in being followed by fewer relapses. In 5 years no cases of hepatic abscess, and 4 only of hepatitis, have been met with.

H. M. H.

WATS (R. C.), LOGANADAN (A. D.) & CONQUEST (C. N.). **Dysentery in Secunderabad.**—*Indian Med. Gaz.* 1928. Jan. Vol. 63. No. 1. pp. 13–16. With 1 chart.

The authors declare that MANIFOLD's work (see this *Bulletin*, Vol. 23, p. 395) inspired them to undertake these observations and to classify their dysentery cases scientifically. Following his technique they found bacillary dysentery nearly nine times more common than amoebic. It was possible to cultivate the organism from nearly 50 per cent. of cases; the great majority were due to Flexner type bacillus. The

main source of infection is undoubtedly the carrier. Among 838 menials—food handlers—3·4 per cent. were found to harbour B. Flexner, and 3·4 per cent. *E. histolytica.* Five of them harboured *Bact. typhosum.*

Of 159 muco-sanguineous stools from which *Bact. dysenteriae* group were isolated, 144 (90·6 per cent.) were alkaline to litmus, the rest (9·4 per cent.) gave acid reaction ; these last were stools sent to laboratory after two or more hours' delay. In six cases of mixed infection, beginning as bacillary dysentery but pathogenic amoebae found on or after fourth day, the reaction was alkaline. Alkaline reaction alone therefore is not sufficient to exclude presence of pathogenic amoebae. No diagnostic importance was attached to "amoebic" exudate or Charcot-Leyden crystals. Out of 178 cases from which specific bacilli were isolated 129 or 72·5 per cent. showed definite "bacillary exudate" at first examination ; a few exhibited this at a later date. Those showing no "bacillary exudate" were of milder nature, containing much mucus with little blood and all due to Flexner type bacillus.

Importance of time in examination of specimens.—Of 165 stools from hospital quite close to laboratory the dysentery bacilli were cultivated in 76, or 46 per cent. Of 252 stools from hospital 1½ miles from laboratory dysentery bacilli were cultivated from 87, or 34·5 per cent.

H. M. H.

MANIFOLD (J. A.) assisted by DE MONTE (A. J.). **Report on an Investigation of Dysentery and Diarrhoea in Poona. Part I. General Findings and Epidemiology. Part II. Laboratory Findings.**—*Indian Jl. Med. Res.* 1928. Jan. Vol. 15. No. 3. pp. 601–641. With 11 charts. [6 refs.]

A record of an exhaustive investigation, thoroughly carried out and a model for future investigations into dysentery in India. Only the gist of the author's conclusions can here be given :—

The diarrhoea known as : (1) Poona-itis is largely a mild Flexner infection, not diagnosed as dysentery in the past because of its mildness.

(2) Bacillary dysentery, mainly B. Flexner, accounts for most of the severer cases ; these were usually diagnosed as amoebic dysentery in former years.

(3) B. Shiga plays only a minor part in Poona dysentery ; and if such cases report sick on first or second day of attack and are treated at once the cases are usually as mild as the B. Flexner infections.

(4) By microscopic examination of mucus it is possible to separate mild bacillary dysentery from diarrhoea in nearly all cases, if hospitals and laboratory co-ordinate properly.

(5) "Dysentery group" as a diagnosis is a confession of failure, and in the main such cases in Poona have been B. Flexner infections.

(6) Bacillary dysentery and diarrhoea are present throughout all months of the year and increase in numbers in the monsoon period.

(7) Amoebic dysentery is a comparatively rare disease among the troops as contrasted with the prevalence of bacillary dysentery.

Epidemiology.—(1) Chlorination of water supply in Poona is efficient. The water supply is not responsible for either dysentery or diarrhoea now endemic in the cantonments.

(2) There is a heavy infection of B. Flexner dysentery among the Indian population in the cantonment.

(3) This is passed by them to the European population and to each other by direct contact (hands, etc.), throughout the year.

(4) Existing sanitary arrangements in Poona are absolutely ideal for the spread of bacillary dysentery.

Laboratory Findings.—(1) Of 117 strains 71·7 per cent. only are agglutinable by Flexner V, W, X, Z and Y serum after many months' subculturing.

(2) Four hours in water bath at 55° C. are insufficient to overcome inhibition zones, and inagglutinability. Eight hour readings have given higher titres of agglutination, and reduced number of inagglutinable cultures by 15·3 per cent.

(3) Only 51 per cent. of the agglutinable cultures examined could be assigned to definite strains by the agglutination method given in *Medical Research Series Special Report No. 42.* The results did not correspond with those found in the serological examinations of the patients' serum, and in one case at least were proved to be incorrect on ascertaining the agglutinogenesis of the infective strain.

(4) Agglutinogenesis experiments and absorption tests are probably required for a definite typing of most strains of B. Flexner, except old laboratory cultures.

(5) Inagglutinability and lack of agglutinogenetic power appear to be closely related.

(6) Evidence of at least one strain with apparently no antigenic relationship to B. Flexner V, W, X, Z and Y has been found, and there are probably many others.

H. M. H.

KODAMA (Tokuzo). **The Prevention of Dysentery in Manchuria.**—*Jl. Public Health Assoc. Japan.* 1928. Feb. Vol. 4. No. 2. pp. 1–6.

The incidence of dysentery in the South Manchurian Railway zone was 7·5 per 1,000 of population, a much higher rate than in Japan proper while the death rate was 10 to 15 per cent. as against 20 per cent. in Japan proper. In South Manchuria there are better facilities for detection of cases. Patients cannot be hidden, and are early placed in hospital. The sources of infection were food and drinks, and flies. There was scarcely any infection from water and very few from contact. Very few cases were amoebic—nearly all were bacillary. Shiga type predominated, next came Y and S types. Shiga is most numerous at beginning of the epidemic; gradually other types appear, among which Y is commonest. Most of the patients were three to four years old: those above seven were very few.

Both dysentery and disturbances of the alimentary canal were remarkably reduced by continuous execution of preventive measures, viz., night soil and other waste removed once daily, and "tetrachloride preparations" sprinkled as germicide. House and surroundings cleaned daily and kept clean. Public washing places cleansed every day. Encouragement of disinfection of vegetables and fruits by washing them in chlorinated water, in every home.

H. M. H.

AGUIAH (A.). Du syndrome dysentérique infantile dans les pays du Proche-Orient. [**Infantile Dysentery in the Near East.**]—*Bruxelles-Méd.* 1928. Apr. 29. Vol. 8. No. 26. pp. 855–863.

An interesting and long paper recording the author's observations. He has carried out in each case :—

(1) Microscopic examination of stools to determine whether dysentery was amoebic, and culture from stools as well to determine if it were bacillary.

(2) Examination of peripheral blood for parasites.

(3) Search in stools for helminth ova.

On this basis he classifies his cases of dysentery into four groups :—

(i) *Non-specific*—comprises all those in which no microbic agent, bacillary or protozoal, can be demonstrated.

(ii) *Specific*—all those in which dysentery amoebae or bacilli can be demonstrated.

(iii) *Parasitic*—Ascaridiasis, oxyuriasis.

(iv) *Toxic*—chemical agents, mercurial and arsenical.

(v) *Secondary*—parenteral infections—e.g., typhoid fever and la grippe. Diagnosis and treatment of each group is discussed. He lays stress on the necessity of dietetic treatment in infants suffering from dysentery. For the rest, bacillary dysentery must be treated by anti-dysenteric serum ; amoebic by emetine and arsenicals.

H. M. H.

MÜHLENS (P.). Gefahren und Behandlung der Folgen der Amöben- und Bazillendysenterie. [**Risks and Treatment of Sequelae of Amoebic and Bacillary Dysentery.**]—*Muench. Med. Woch.* 1927. Oct. 28. Vol. 74. No. 43. pp. 1832–1834. [18 refs.] [Tropical Inst., Hamburg.]

While emetine is of undoubted value in acute amoebic dysentery, hepatitis and liver abscess, for the more chronic sequelae of amoebic and bacillary dysentery the drug of choice is yatren. Even in hepatitis and liver abscess the author quotes cases showing cure of these conditions by emetine yatren, or even by yatren alone. In the other *sequelae of amoebic dysentery*; viz., chronic dysentery, cystitis, bronchitis, iritis, cerebral abscess, arthritis, membranous and ulcerative colitis, obstinate constipation, and the very numerous cyst passers, all of which have failed to respond to emetine treatment, and for the *sequelae of bacillary dysentery*—viz., chronic dysentery, ulcerative, membranous and mucous colitis, and spastic constipation, the author claims, and quotes cases in support, favourable results and often cure after yatren treatment, mainly by yatren lavage per rectum. Beneficial results from yatren cases have also been reported in sprue cases.

H. M. H.

CHATTERJEE (Bijoy Krishna). **A Case of Balantidial Dysentery.**—*Indian Med. Gaz.* 1928. Feb. Vol. 63. No. 2. p. 79.

A Hindu male, a *ganja* smoker, had suffered for fifteen years from dysentery. After a dose of mag. sulph. his stools revealed many motile *Balantidium coli*. The interest of this case lies in the rarity of *Balantidium coli* infections in India. Patient had not been associated in any way with pigs or monkeys—the natural hosts of the parasite—but he had often eaten porcupine, which perhaps is another host for Balantidium. Apparent cure was effected by thymol per os, and protargol per rectum. This patient had bouts of severe abdominal colic—possibly because deprived of his *ganja* ; they were cured by a few small doses of *Cannabis indica*.

H. M. H.

LUGER (A.) & KORKES (L.). Ein Beitrag zur Emetinbehandlung der Balantidiencolitis. [**Emetine Treatment in Balantidial Colitis.**]—*Med. Klin.* 1928. Mar. 2. Vol. 24. No. 9. pp. 330–332.

An exhaustive account of a man who had had pyloric ulcer, and later developed tuberculosis. He suffered from diarrhoea. *Balantidium coli* was found in the stool. Rectoscopy revealed oedematous inflamed mucous membrane, the mucus from which showed besides Balantidium many spirochaetes. Emetine intravenous injections were followed by disappearance of Balantidium from the stools. Two months later the patient died; tubercle of lungs and small intestine was then demonstrated, together with atrophy of mucous membrane of colon, no ulceration and no Balantidium. The patient had been associated with pigs. Balantidium infection has hitherto been very rare in Austria.

H. M. H.

HENRY (T. A.) & BROWN (H. C.). **An Indian Remedy against Dysentery.** [Correspondence.]—*Lancet.* 1928. Jan. 14. p. 108. [7 refs.]

An account of experience of *Holarrhena dysenterica* bark (Kurchi bark) in England, with references.

A. G. B.

CAPISTRANO PEREIRA (Sebastião). A proposito de um caso de dysenteria amebiana.—*Sciencia Med.* 1927. July. Vol. 5. No. 7. pp. 370–376.

DOPTER. L'amebiasi polmonare.—*Riforma Med.* 1927. Aug. 1. Vol. 43. No. 31. pp. 736–737.

GODINEZ GUTIERREZ (Jacob). Tratamiento de la disenteria amibiana por el yatrén 105. Tesis.—40 pp. 1927. Apr. Universidad de Guadalajara Facultad de Medicina. Mexico. Imp. "El sobre Azul" Motolinia 25.

HOSHI (N.). Kinderdysenterie von Standpunkte der Hausepidemie betrachtet.—*Oriental Jl. Dis. Infants.* 1927. July. Vol. 2. No. 2–3. German summary pp. 134–135. [In Japanese.] [Dairen Hosp., Dairen.]

IZQUIERDO SALAZAR (Alfredo D.). El yatren 105 en la disenteria amibiana. Tesis para el doctorado en medicina y cirujia.—69 pp. 1927. Bogotá. Tip. Voto Nacional.

MESSINA (Raffaele). Ameba dissenterica. Diffusione della dissenteria amebica, caratteri morfologici e culturali delle amebe, varietà delle forme amebiche. Sintomatologia, decorso, forme cliniche, complicazioni e terapia della dissenteria amebica.—*Riv. Clin. Med.* 1927. Oct. 30. Vol. 28. No. 20. pp. 798–808. [45 refs.]

LEPROSY.

DE LANGEN (C. D.) & HERMANS (E. H.). Rapport sur le problème de la lèpre. [**Report on the Problem of Leprosy.**]—*Acta Leidensia.* (*Scholae Med. Tropicae.*) 1927. Vol. 2. pp. 160–176. With 2 maps.

This is a report to the Hygiene organisation of the League of Nations, and it furnishes an interesting discussion on the methods of utilizing our present knowledge of treatment in dealing with leprosy. Maps of the world distribution of leprosy per mille and per area are given. Epidemiology is next discussed and our ignorance of the exact degrees of contagiousness and of the mode of infection is emphasized, but the authors are in agreement with the general opinion that infection probably takes place through the skin and mucous membranes, and is most often due to prolonged house contact with an infective leper ; they urge, however, further investigation on these points, especially during febrile attacks. Hospital treatment to attract the patients is more important at the present time than compulsory isolation, so much relied on hitherto, for which purpose special hospitals should be organized in each infected area, so that the patients can be treated in their own districts by experts, which would also result in increasing clinical and pathological knowledge of the disease. Early cases would also be attracted with much better results of treatment.

Different systems of combating leprosy are next discussed, and the old compulsory segregation with little or no treatment is condemned. The Hawaian plan of combining compulsory isolation with paroling recovered cases is an improvement, but is impracticable in many countries on account of the cost. The Norwegian system of largely voluntary isolation, with the treatment of well-to-do at their homes under supervision, has been effective in that country, but not so successful elsewhere. The authors advise for the Dutch East Indies the establishment of a board of three medical men in each district or group of districts to examine all persons reported to be lepers under a system of compulsory notification by all medical men, all infective cases to be sent to hospital for treatment as long as they remain diseased, but early uninfective cases should be treated at home, and inspected by the Board at regular intervals. Infants born of leper parents should be separated from them as early as possible, and certain trades interdicted to lepers. The provision of the best available treatment in the hospitals to attract the lepers is thus the key note to the modern prophylaxis of leprosy, and they advocate an international organization to study and advise on the whole subject.

L. Rogers.

BRITISH GUIANA MEDICAL ANNUAL FOR 1925. pp. 86–110. **Leprosy Supplement. Leprosy in British Guiana. Report of a Departmental Medical Conference held in Georgetown, September, 1924-May, 1925.**

FRENDO (G. A.). **Notes on Leprosy and its Treatment from Observations made in the Leper Asylum, Mahaica, during the Year 1923.**—*British Guiana Med. Annual 1925.* pp. 111–117.

ROSE (F. G.) **Leprosy Statistics and Legislation in British Guiana.**—*Ibid.* pp. 118–121.

The first part of an interesting description of leprosy in this Colony deals with the conclusions of a leprosy conference, which recommended

revision of the law on the subject, the formation of a board of medical experts to advise in certification, admission and discharge of lepers, and persistence in modern forms of treatment. The history of the prevalence of the disease as far as it is known is next dealt with. The results of an investigation by J. GLAVINA regarding the infectivity of the anaesthetic type of leprosy, as revealed by bacteriological examinations, gave positive results in 20 to 25 per cent. as regards the nasal mucous membrane if smears of both nostrils are examined; this affords an accurate guide to infectivity, which is greater the earlier the case. In October, 1924, the known lepers numbered 328, including released cases under supervision, and between 1906 and 1924 244 cases had been repatriated to India, and this accounts for the greater part of the reduction in the numbers during the last two decades.

Part 2 deals with treatment at the Mahaica Leper Asylum in 1923 by G. A. Frendo, who notes that the vast majority are very advanced cases, and he urges the systematic search for early cases, if the full advantages of the modern treatment are to be obtained. Moogrol intramuscularly and Harper's intravenous injections of the whole oil were used, the first being preferred. Repeated courses of six injections, one a week, have a cumulative effect, nodules were observed to soften and become absorbed, and in the few early maculo-anaesthetic cases good results are pretty constant. A card-index system of records is advised.

Part 3 by F. G. Rose gives further details of the history of leprosy in the Colony, which is well known to leprologists.

L. R.

DENNEY (O. E.). **National Leper Home (United States Marine Hospital), Carville, La. Review of the More Important Activities during the Fiscal Year ended June 30, 1927.**—*Public Health Rep.* 1928. Apr. 6. Vol. 43. No. 14. pp. 810–817. With 4 figs. on 2 plates.

"The 12-month period here reported on has been especially satisfactory in that an increasing number of patients have shown gratifying progress towards permanent arrestment of leprosy." New admissions numbered 56 and 255 remained at the end of the year. Chaulmoogra ethyl esters, augmented by the crude oil in formalized capsules orally, have been continued. Ultra-violet rays have relieved pains and healed perforating ulcers, especially rays from the carbon arc burner, and metallic applicators heated to various temperatures have had a good effect on local lesions. Work and exercise is encouraged. The Mississipipi floods threatened the colony for a time and necessitated work at the levee. Everything is done in this model colony to make the patients comfortable and happy.

L. R.

ROBINEAU. La question de la lèpre au Maroc. [**Leprosy in Morocco.**] —*Rev. Méd. et Hyg. Trop.* 1928. Jan.–Feb. Vol. 20. No. 1. pp. 5–13. With 2 text figs. [2 refs.]

The number of known lepers is placed at 302, but it is recognized that the true figure is much greater, and the large majority are highly contagious active cases. Treatment with the ethyl esters of chaulmoogra oil should be the basis of prophylaxis, and all the Musulman

lepers will come for the treatment when its efficiency is shown. The author advises the segregation of infective cases on the Island of Mogador.

L. R.

COCHRANE (Robert G.). **Leprosy in Europe, the Middle and Near East and Africa.**—73 pp. 1928. London: World Dominion Press, 1, Tudor Street, E.C.4. [2s.]

This is the second leprosy survey by this authority, and it contains valuable information not easily found elsewhere. The highest number of lepers given for Europe is 702 in the Baltic countries, including Norway and Sweden. Palestine records 47, but the dry areas from Arabia to Persia have few. Notes are given regarding work on leprosy in our African Colonies, the numbers in which were estimated last year by Mr. OLDRIEVE, Secretary to the British Empire Leprosy Relief Association, at well over 150,000, and a table is appended giving the known data regarding the number of lepers and the rates per mille in the countries dealt with.

L. R.

WADE (H. W.) & RODRIGUEZ (J. N.). **A Description of Leprosy. Its Etiology, Pathology, Diagnosis and Treatment for Health Officers and Others concerned in Antileprosy Work. Prepared under the Auspices of the Culion Medical Board, Philippine Health Service.**—93 pp. With 26 figs. on 14 plates & 4 text figs. 1927. Manila: Bureau of Printing.

This is a very valuable and well illustrated description of leprosy by two of the most experienced workers in the world at the great Culion Leper Settlement in the Philippines, and it should be in the hands of all who are dealing with the disease. The first 89 pages are devoted to etiology, bacteriology and pathology, followed by an excellent clinical description with photos, while the sections on treatment include the technique of intravenous and other injections. The laws and official regulations conclude a compact work of 93 pages containing all the essentials of the subject.

L. R.

MONTERO (Aniceto). La lepra, además de ser contagiosa, es una enfermedad hereditaria? [**Is Leprosy Hereditary as well as Contagious?**]—*Abhandl. a. d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift NOCHT.] pp. 357–360.

A female leper became pregnant; she suffered from a severe grade of the mixed form. Parturition occurred at the eighth month and the child was immediately taken away from the Asylum and was given to a healthy family and fed artificially. It was not suckled once by the mother. Lepra bacilli were found in the placental tissues, in the blood-clot and in the blood of the umbilical cord. The serum of the child was examined; it gave a positive Wassermann reaction and lepra bacilli were found in it microscopically. The infant died six weeks later with diarrhoea and generalized pemphigus, and in the fluid of the latter lesions the bacillus was also found.

The author argues that treatment of the mother leads to the bacilli having a reduced virulence which is of advantage to the offspring and that later,

when the child's defences become weakened, the disease slowly develops ; if it does not, then these defensive powers have become reinforced as life progresses. In several of his patients he has been able to show that the mother had suffered from what he calls " atypical leprosy " of short duration, becoming cured spontaneously, or being treated successfully as a case of ozaena or mild nasal affection, though the bacilli were present.

H. Harold Scott.

SITANALA (J. B.). **The Norwegian Leprosy Laws, as they are to-day in Norway, should be applied to the Dutch Indies.**—*Acta Leidensia (Scholae Med. Tropicae).* 1927. Vol. 2. pp. 177–186.

This paper deals once more with the well known system of mild segregation measures by means of which leprosy has been reduced from nearly 3,000 cases in 1856 to 100 at the present time. He emphasizes the difficulties in treating lepers. but states " that the beginning cases are certainly curable ! An invaluable result of our modern therapy !" He also advises health committees to help the lepers in every village, an institute for the scientific study of the disease and the establishment in Holland of a leprosy office in the spirit of the British Empire Leprosy Relief Association at London.

L. R.

PINEDA (Eloy V.). **The Presence of *Mycobacterium leprae* in the Placenta and Umbilical Cord.**—*Jl. Philippine Islands Med. Assoc.* 1928. Feb. Vol. 8. No. 2. pp. 67–70. [17 refs.] [Culion Leper Colony, Philippine Health Service.]

Previous observations on this point have been based on few cases, but the author now reports observations on 104 placentas at Culion, with positive results as regards finding acid-fast bacilli in 57, or 53 per cent. In 24 per cent. the organism was also found in the umbilical cord, showing passage through the placenta to the foetus, but in only one case was it found in the cord but not in the placenta. Both examinations of direct smears of the cut surfaces, and also preparations of the second centrifuge deposit of the pulp of the organ after passing through a press were examined, and one-fourth of the cases were only positive by the latter concentration method. In view of the great rarity of the very early development of the disease in the children of lepers, the author thinks that the organism is overcome by the tissues of the foetus in the great majority of those it reaches through the placenta, but the possibility of intrauterine infection should be considered when the disease develops in early infancy.

L. R.

ALEIXO (A.). Sobre a pesquisa dos bacillos de Hansen nas manchas. [**Search for Bacilli in Leprotic Macules.**]—*Brazil Medico.* 1927. Dec. 17. Vol. 41. No. 51. pp. 1337–1341.

This question is of importance from four different aspects : (1) For diagnosis ; (2) for determining the stage and character of the disease ; (3) for prognosis ; (4) for directing treatment.

Various methods of making the investigation have been proposed from time to time with conflicting results ; among these are simple scarification, vesication and examination of the centrifuged fluid;

removal of a fragment of skin, triturating it in saline and centrifuging; bloodless examination by scarification of a pinched up portion at the periphery of the macula, with or without puncture. The last is recommended by the author, or a procedure of incision at the edge of a macula, squeezing the edges of the cut, scraping the subepithelial layers and spreading the material on slides.

Positive findings are more frequent when the erythematous margin is examined. Brief accounts are given of three cases of active generalized leprosy, in all of which the results were positive; of nine cases of the maculo-anaesthetic type with few symptoms, only one was positive and that after the second attempt, although in this patient examination of the nasal mucosa gave no lepra bacilli; of six cases with definite symptoms two were positive and in both of these the bacilli were present also in the nasal secretion.

H. Harold Scott.

ARCOS (G.) [**Contagion and Transmission in Leprosy.**]—*Bol. del Hosp. Civil de San Juan de Dios.* 1927. Jan. Vol. 1. p. 19. [Summarized in *Arch. Dermat. & Syph.* 1927. Dec. Vol. 16. No. 6. p. 768.]

Conjugal infections are rare, but the author met with six children of one family all infected from their leper parents. He has infected a macacus monkey with an evanescent tubercle. Affection of the genital organs may cause impotence and sterility.

L. R.

LIE (H. P.). Om leprøse karforandringer. [**Leprous Changes in the Vessels.**]—*Norsk Mag. f. Laegevidenskapen.* 1927. Nov.–Dec. Vol. 88. No. 11–12. pp. 1108–1119. With 1 text fig. [5 refs.] German summary pp. 1119–1120.

After a short historical survey the author describes leprous changes of the peripheral vessels of the extremities in nodular leprosy. These changes, which are mostly of a sclerosing nature, affect both arteries and veins, although the latter are most often and most severely involved. The changes may be so great as to produce closure of the vessel. The tunica adventitia and intima are most severely altered, but changes also occur in the tunica media.

Leprosy bacilli are always present in the vascular walls, sometimes in large quantities. The changes may either proceed from the leprous infiltrations in the skin, the leprosy bacilli passing through the lymph tracts along the vessels, or they may be produced by direct infection from the blood; for the bacilli can certainly pass into the blood at a very early stage of the disease either through the lymph-stream or through the walls of the capillaries or through the fine vessels.

It is strongly emphasized that no changes worth mentioning can be found in the large vessels such as the aorta, or in the vessels of the heart, brain, spinal cord, liver and spleen. In this particular there is *a fundamental difference between leprosy and syphilis.* The vascular changes may cause swelling and cyanosis of the affected parts of the skin. The author also describes vascular changes in lepra mutilans, but is of the opinion that they are probably secondary and are to be ascribed in some way or other to the destruction of the peripheral nerves.

L. R.

GOUGEROT (H.). Les formes atténuées, localisées, fixées curables de la lèpre. [**Mild Localized Curable Forms of Leprosy.**]—*Rev. Prat. Malad. des Pays Chauds.* 1927. Oct. Year 6. Vol. 7. No. 10. pp. 501–509. [4 refs.]

The author describes different types of mild localized curable leprosy, which in common with other French writers he considers to be more common than is generally held. They include cases showing a few brown anaesthetic patches, localized tubercles, and those showing a single primary tubercle on the skin, which should be removed in the hope of effecting a cure, or more rarely on the nasal mucous membrane, which should be cauterized. Another variety is the atypical nerve case, including perforating ulcers of the foot, pain or muscular wasting localized in an extremity, isolated anaesthetic pigmented patches, mucous discharge from the nose, iritis without other obvious cause, and localized orchitis. Such cases are likely to be overlooked by inexperienced workers, and they commonly yield to simple treatment by chaulmoogra oil and its derivatives and other remedies.

L. R.

i. ARMSTRONG (C. L.). **Report of Case of Leprosy with Unusual Manifestations.**—*U.S. Veterans' Bureau Med. Bull.* 1927. Dec. Vol. 3. No. 12. pp. 1248–1252. With 2 plates.

ii. BAYON (H. P.). **A Case of Undiagnosed Leprosy of Many Years Duration.**—*Ann. Trop. Med. & Parasit.* 1927. Dec. 31. Vol. 21. No. 4. pp. 381–384.

iii. GOMES (J. M.). Lepra? (Considerações em torno de um caso clinico). (**Leprosy? Discussion of a Clinical Case.**)—*Rev. Biologia e Hyg.* São Paulo. 1927. Vol. 1. No. 2. pp. 81–85. With 1 text fig. & 1 coloured plate. [4 refs.] English summary p. 85. [Inst. of Hyg., S. Paulo, Brazil.]

iv. DENNEY (Oswald E.) & WOOLEY (Jerald G.). **Leprosy complicated by Syphilis and Hypernephromatosis. Report of a Case.**—*New Orleans Med. & Surg. Jl.* 1928. Mar. Vol. 80. No. 9. pp. 586–589. With 6 figs. [1 ref.]

v. NÉNON (J.). Un cas de lèpre autochtone chez un arabe nomade des Hauts-Plateaux algérois. [**Indigenous Leprosy in an Arab of the Algerian Plateau.**]—*Arch. Inst. Pasteur d'Algérie.* 1927. Dec. Vol. 5. No. 4. pp. 484–488. [8 refs.] [Saharan Lab., Pasteur Inst., Algiers.]

vi. WHITE (Richard Joseph). **Three Cases of Leprosy in One Mexican Family.**—*Southern Med. Jl.* 1928. Apr. Vol. 21. No. 4. pp. 311–312. With 1 text fig.

vii. PAUTRIER (L. M.). Hématomes spontanés à culture pure de bacilles de Hansen, suite probable de thrombophlébites, au cours de l'évolution d'une lèpre. [**Spontaneous Haematomata in a Leper with Pure Culture of Lepra Bacilli.**]—*Bull. Soc. Française Dermat. et Syph.* 1928. Feb. No. 2. pp. 155–157.

viii. IHARA (Yoshisada). Ueber einen Fall von Lepra mit rein sensiblen Symptomen. [**A Case of Leprosy with Sensory Symptoms alone.**]—*Arch. f. Dermat. u. Syph.* 1928. Apr. 19. Vol. 154. No. 3. pp. 634–639. With 3 text figs. [8 refs.] [Med. Clinic, Imperial Tohoku Univ., Sendai.]

i. This is a single case in which the early signs were overlooked for six years, until an acute exacerbation occurred following debility after severe haemorrhage due to tonsillectomy.

ii. Another case presenting difficulty in diagnosis and seen by the recorder many years ago at Robben Island. Brownish red patches were for long treated as syphilis without effect, and more typical leprosy lesions developed later.

iii. A case of erythematous infiltration of the skin with acid-fast bacilli in the nose.

iv. A leper of ten years duration admitted to the Carville leper institution with the complication of syphilis, and unsuspected double hypernephromatosis of adrenals and right kidney found post-mortem.

v. A mixed case of leprosy of local occurrence in an Arab in the higher region of Algeria.

vi. Three cases of well developed infective leprosy among a family of eight Mexicans, who had resided for long in Texas without being detected, and thus were a danger to this Southern United States area.

vii. An interesting and very rare case of multiple haematoma developing in subcutaneous tissues of the limbs, probably from thrombosis of superficial veins, the aspirated broken down blood of which contained very large numbers of leprosy bacilli in pure culture. The author does not know of any similar case having been reported.

viii. A case presenting difficulties in diagnosis owing to the absence of any symptoms other than symmetrical alterations in sensation of the arms.

[The above cases emphazise the necessity of better teaching of the early signs of leprosy in our medical schools to allow early cases to be recognized and treated by medical men in the more amenable stages of the disease.]

L. R.

PETER (F. M.). Herpes zoster bei Lepra. [**Herpes Zoster in Leprosy.**]—*Dermat. Woch.* 1927. Feb. 12. Vol. 84. No. 7. pp. 220–224.

The writer describes a case of leprosy with herpes in the region of the first trigeminal branch on the left side in a leper with mainly maculo-anaesthetic lesions of two years standing, and he thinks the herpes developed in a nerve area already injured by leprosy.

L. R.

BOYD (T. C.) & ROY (A. C.). **Notes on the Cholesterol Content of Indian Blood in Health and in Leprosy.**—*Indian Jl. Med. Res.* 1928. Jan. Vol. 15. No. 3. pp. 643–651. [1 ref.]

One hundred control bloods were first tested for cholesterol by the method of Myers and Wardel and it was found to average 0·116 per 100 cc. of whole blood, and to vary between 0·082 and 0·184. Cases of leprosy from MUIR'S Calcutta clinic were then tested with an average of 0·099 and variations from 0·13 to 0·08 in 15 early cases ; the average figure was 0·08 and the extremes 0·07 to 0·109 in 19 advanced skin cases, and an average of 0·096 and the variations from 0·08 to 0·109 in 10 cases after treatment. They conclude that the normal amounts of cholesterol in Indians is slightly less than in British and American observations, and that the content is reduced in the early stages of leprosy, and still more so in advanced cases, and that in the latter type it does not return to normal after treatment.

L. R.

GOMES (J. M.), LEITÃO, Filho (C. A. Pereira) & WANCOLLE (A.). Cholesterinemia na lepra. (**Cholesterol in the Blood in Cases of Leprosy.**)—*Rev. Biologia e Hyg.* São Paulo. 1927. Vol. 1. No. 2. pp. 39–52. English summary p. 53. [16 refs.] [Inst. of Hyg., S. Paulo, Brazil.]

These workers have investigated the cholesterol content of the blood in lepers of S. Paulo, Brazil, and found a reduction in proportion to the gravity of the case, and a decrease during a febrile recrudescence. Moreover, chaulmoogra oil increases the cholesterol, especially in early cases, a high figure permitting of temporary cessation of the drug to improve the patient's general condition. Patients with relatively high cholesterol rarely develop severe forms of leprosy.

L. R.

DE MARVAL (Luis). Contribución al estudio de la sangre en la lepra. [**Contribution to the Study of the Blood in Leprosy.**]—*Semana Méd.* 1928. Apr. 26. Vol. 35. No. 171 (1789). pp. 1034–1045. [" Francisco J. Muñiz " Hosp., Buenos Aires.]

The results here recorded were compiled from examination of 100 cases of leprosy of all forms in the course of a year. As regards the red corpuscles no general changes were noted ; once only there was a slight anisocytosis and hypochromia. The sedimentation rate was not tested. As regards leucocytes 20 presented a leucocytosis of over 10,000 and 8 were below 5,000 per cmm. Eosinophiles were increased to between 4 and 5 in most cases, and wherever this occurred the stools were examined for helminthic infection, but such was not found. The nervous forms of leprosy gave the higher eosinophilia, namely, 6·5 per cent. Neutrophiles were about normal, relatively and absolutely ; the average lymphocyte count was 23·74 per cent. Large mononuclears were increased, particularly in the maculo-anaesthetic cases where the percentage was over 8. The viscosity was a little above normal, with a slight reduction of bleeding-time. The author sums up his findings in the following words (translated) : " Red cells unaltered ; leucocytes normal to subnormal ; eosinophilia both relative and absolute ; neutrophiles and lymphocytes no change of importance ; monocyte increase both relative and absolute, but to a mild degree ; platelets normal."

H. Harold Scott.

UNNA, Jr. (Paul). Neuere Behandlungsmethoden der Lepra. [**Recent Methods of Treatment of Leprosy.**]—*Dermat. Woch.* 1928. Mar. 24. Vol. 86. No. 12. pp. 383–394. [12 refs.]

This is an historical review of different methods of treatment from that of UNNA senior in 1885 with pyrogallol plaster locally, through the use of antileprol by ENGEL Bey in Egypt in 1909 and of nastin by DEYCKE in the same year. A change was made when during the war ROGERS and DEAN worked out the methods of using soluble active products of chaulmoogra oil by injection, which have since been extensively adopted. Mention is also made of vaccines, X and violet rays, electric currents, salvarsan, eparsino, silver, gold, bismuth and antimony, none of which have proved of much value as compared with the chaulmoogra preparations, which he states were used in the form of the oil and as

gynocardates long ago by UNNA senior. The author's well-known treatment by the surgical removal of large nodules, together with the use of carbon dioxide snow and pyrogallol plaster or ointment, is once more described.

L. R.

HOFFMANN (W. H.). Ueber Behandlungsversuche bei der Lepra. [**Treatment of Leprosy.**]—*Dermat. Woch.* 1928. Mar. 24. Vol. 86. No. 12. pp. 394–402. [State Leper Hosp., Health Ministry, Havana.]

The author has worked for long at the Havana leper hospital with 200 cases. The chaulmoogra treatment has continued to answer well and has led to great progress, and in many cases its timely use has led to cure in the sense that the patients become free from all evident symptoms and contagion. He thinks also that the gold treatment with krysolgan has a curative effect on eye lesions. More rapid progress would result if trials of remedies could be made on infected animals. Progress is also greatly handicapped by cases coming too late for effective treatment, and the methods of early diagnosis require to be improved. The old type of leper asylum requires to be replaced by hospitals well equipped for treatment, for the cure of the disease now furnishes the only scientific basis of a prophylactic campaign against leprosy.

L. R.

DE LANGEN (C. D.). Traitement de la lèpre. [**Treatment of Leprosy.**] —*Acta Leidensia* (*Scholae Med. Tropicae*). 1927. Vol. 2. pp. 143–150.

A review of the literature shows that complete cures of leprosy have been reported by various observers in from 5 to 50 per cent. of cases, but the author's experience in 102 cases in a leper hospital in the Dutch East Indies only gave 5 per cent. of recoveries under the chaulmoogra ethyl ester treatment. Only 8 were early cases with 4 cures, one of which relapsed, but recovered again with further treatment. Of 24 more advanced cases only 1 recovered and 15 showed great improvement, and of 62 advanced serious cases none were cured and only 29 were improved. Cases should be treated in hospitals, and should be detected in the early stages if good results are to be expected, since early diagnosis enormously improves the prospect of obtaining cures. He thinks that the reported failures to reproduce the disease by inoculation is because only certain stages, especially during acute febrile exacerbations of the disease, are infective.

L. R.

LARA (C. B.). **Evaluation of the Results of Treatment of Leprosy with the Chaulmoogra Derivatives.**—*Jl. Philippine Islands Med. Assoc.* 1928. Feb. Vol. 8. No. 2. pp. 56–64. [17 refs.]

The author is justified in claiming that the trial on such a large and prolonged scale as in the Culion Leper Settlement of the modern treatment by injections of the active preparations of chaulmoogra oil, permits them to draw more reliable conclusions than those of certain sceptics with very limited experience, so this paper is of exceptional value.

The effect on the public of the improved results is strikingly shown by the fact that "whereas previous to the employment of the new methods, six years ago, most of the lepers had to be captured or forcibly detained, during the last three years the great majority have presented themselves voluntarily for isolation and treatment," and "a more general and adequate appreciation of the value of the chaulmoogra preparations will be of tremendous and far-reaching importance in the eradication of the disease."

In estimating the results only bacteriologically negative or apparently cured cases are taken into account, thus affording a stringent test of the efficacy of the treatment; yet in spite of the great majority of the lepers being at an advanced stage on admission, and all bacteriologically positive, in the six years up to September, 1927, no less than 536 had been paroled or discharged as recovered, against only 47 negatives in 15 years from 1906 to 1921 in the same colony. Moreover, a further 257 negative cases are awaiting parole, and by December 31st, 1927, more than 600 will be paroled or discharged, and a total of more than 900 negatives will be credited to the present treatment, or approximately 16 per cent. of the advanced series of cases treated. These figures can leave no doubt in the mind of any medical man regarding the great advance made.

The total ethyl esters of *Hydnocarpus wightiana* oil with 0·5 per cent. iodine, in doses gradually increased from 0·5 cc. to 5 cc. intramuscularly once a week has been the preparation most generally used for an average period of 2½ years. Recently small doses have been injected beneath skin lesions with good results, especially in relapsing lesions. The conditions which mainly influence the results are that children do best, but the period of most active sexual life in the married or cohabiting couples is comparatively unfavourable, especially in males; and females do rather better than males. Of the different types the percentages of negative cases are 0·79 in cutaneous, 6·0 in mixed and 50·7 per cent. in nerve cases, partly due to the tendency of nerve affections to decline in activity after a time. Good hygiene, diet, exercise, the avoidance of sexual indulgence and pregnancy and the removal of complicating diseases, such as syphilis and helminthiasis, are all beneficial. The improvement has been greater in cases not showing reactions to the drug, and these are believed by the Culion authorities to be harmful, contrary to the opinion of Indian workers. [The latter deal mainly with earlier cases, in which reactions are safer and more beneficial.]

It is still too early to say what the ultimate results are since many of the discharged patients have not been followed up, but of those detained for 18 months to two years after becoming negative before release, only 5·1 per cent. showed any recrudescence of the disease, and three-fourths of these cleared up with further treatment, and among 74 detained for over two years, only 1·3 per cent. recurred. Altogether these large scale results fully justify the general opinion that there is now hope for the leper.

L. R.

NICOLAS (Catalino) & ROXAS-PINEDA (Elisa). **Results of Antileprosy Treatment of Children in the Culion Leper Colony.**—*Jl. Philippine Islands Med. Assoc.* 1928. Mar. Vol. 8. No. 3. pp. 135–136.

This is a valuable report on 70 confirmed cases of leprosy in children of 1⅔ to 15 years of age with bacteriological positive lesions for form

a few months to five or more years, treated with ethyl esters and other chaulmoogra preparations for from ten months to five years and six months, but mostly for not more than two years. Of 36 males, 18, or 50 per cent., and of 34 females, 20, or 58·8 per cent. are now negative. Of 36 early cutaneous cases 24, or 66·6 per cent. are negative, as are 3 of 4 early mixed type, so that of the 40 early cases 27, or 67·5 per cent. have become negative, but only 37 per cent. of 27 moderately advanced cases, and 1 of 3 advanced ones. The average duration of treatment was 2 years 5 months for early, 2 years 7 months for moderately advanced, and 4 years for advanced cases. Ethyl esters with 0·5 per cent. iodine were mainly used, with which in early or slightly advanced cases a large percentage of apparent cures is obtained.

L. R.

ROGERS (Leonard). **Recent Advance in the Treatment of Leprosy and its Bearing on Prophylaxis.**—*Practitioner.* 1928. Apr. 12 pp.

After a brief description of recent advances in treatment, including the use of the new form of sodium hydnocarpate called alepol, and of MUIR'S iodide of potassium treatment, the results obtained in the Philippines, Hawaii and Calcutta are reviewed, showing that in Hawaii, 8 per cent. of advanced cases, 34 per cent. of moderately advanced, and 64 per cent. of early cases had recovered. The importance of attracting early cases for treatment is emphasized, and it is pointed out that with the present treatment compulsory segregation, unmodified by allowing early, for the most part uninfective, cases to be treated at home or as out-patients without isolation, may easily do more harm than good by leading the early cases to be hidden until the most favourable time for treating them is past, for in both the Philippines and in South Africa the cases obtained by compulsory segregation average from six to eight years' duration on discovery, during which they may have infected others. It is also urged that under favourable conditions, such as in Europe, by examining all the households and other close contacts of all known lepers every six months for five years, probably 80 per cent. of infections would be detected and cleared up by treatment, so that in a single decade the disease could be very greatly reduced. This plan is being adopted in several European countries, and if successful its use could gradually be extended to other areas.

L. R.

i. ROSE (F. G.). **The Treatment of Leprosy at the Mahaica Leper Hospital, British Guiana.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1928. Mar. 31. Vol. 21. No. 6. pp. 481–488.

ii. WALDRON (G. D. K.). **Some Notes on Moogrol in the Treatment of Leprosy.**—*West African Med. Jl.* Lagos. 1928. Jan. Vol. 1. No. 3. p. 56.

iii. SHARP (L. E. S.). **Brief Report on Leprosy treated in Kigezi District, January 1st, 1922—December 31st, 1926.**—*Uganda Protectorate Ann. Med. & San. Rep. for the Year ended 31st December 1926.* Appendix No. VI. pp. 91–92.

iv. HORWITZ (Philip). **A Preliminary Analysis of the Treatment of Lepers at Palo Seco with the Ethyl Esters of the Fatty Acids of Chaulmoogra Oil.**—*Proc. Med. Assoc. Isthmian Canal Zone.* 1921–1926. Vol. 14. pp. 55–59.

v. DELANOË (E.). Essai d'un traitement mixte de la lèpre. [**A Mixed Treatment in Leprosy.**]—*Bull. Soc. Path. Exot.* 1927. Dec. 14. Vol. 20. No. 10. pp. 953–957.

vi. JOHANSEN (Frederick A.). **Benzocaine-Chaulmoogra Oil in the Treatment of Leprosy. Preliminary Note on the Use of an Oil-Soluble Analgesic which renders Intramuscular Injections of Chaulmoogra Oil Painless.**—*Public Health Rep.* 1927. Dec. 9. Vol. 42. No. 49. pp. 3005–3010. With 12 figs. on 5 plates.

vii. ROGERS (Leonard). **The Curative Action of Hydnocarpates and Iodides in Leprosy.**—*Lancet.* 1928. Jan. 14. pp. 73–74. [10 refs.]

viii. LABERNADIE. Trois cas de zona survenus chez des lépreux en cours de traitement. [**Occurrence of Three Cases of Herpes Zoster during Treatment for Leprosy.**]—*Bull. Soc. Française Dermat. et Syph.* 1927. Nov. No. 8. pp. 762–766.

i. F. G. Rose reports on 175 patients who had completed a course of treatment of whom 50 had sodium morrhuate and 10 thymol without any good results, and 10 each creosoted *Hydnocarpus wightiana* oil and 10 sodium hydnocarpate with promising results; the remaining 85 were treated with ethyl esters of the same oil supplied by Smith Stanistreet & Co., of Calcutta under the name of "Hydnestryle" with 19 cured with loss of all symptoms, 39 arrested and 30 improved, while of 55 bacteriologically positive 23, or 41·8 per cent., had become negative. For ulcers zinc ionization and ultra-violet rays from a mercury vapour lamp were of great value in healing perforating ulcers of many years standing.

ii. Waldron in Nigeria reports on seven months' treatment of 17 lepers with injections of the chaulmoogra ethyl ester moogrol, and found undoubted considerable curative effect, but only in those cases which reacted.

iii. L. E. S. Sharp of the Kigezi district of Uganda reports on 59 lepers during five years, of whom 28 were treated for less than 4 months, 24 for 4 to 12 months, and only 7 for over one year. Ethyl esters were used in 53 of them by MUIR's method, but only 12 of the 50 treated for over one month showed improvement; in only one was it very striking, and even early cases failed to improve, so he suggests that the Uganda strain of leprosy is very resistant.

iv. P. Horwitz reports on the use of ethyl esters, on the lines of the Honolulu workers, at the Palo Seco Leper Colony in Panama, with 195 admissions since it was established in 1907. Of 65 treated cases, only 39 had been under treatment for more than five weeks, and 20 of these already showed some improvement. He considers the results to "have been very satisfactory" and the remedy to be superior to all others in leprosy, although it is too early to write with regard to the ultimate results.

v. E. Delanoë reports on seven women and children lepers treated by collobiase chaulmoogra, chaulmoogra oil and sodium gynocardate, together with novarsenobenzol one after the other, and his short experience leads him to think that a combination of remedies is more efficient than any one of them. Various degrees of improvement were obtained in all the cases.

vi. F. A. Johansen reports from the Carville Leper Colony of the United States on the addition of benzocaine to chaulmoogra oil to lessen the pain of intramuscular injections. As it is more soluble

in olive oil he recommends chaulmoogra oil 90, olive oil 10 and benzocaine 3 parts, made up by dissolving the salt in the olive oil and adding the mixture to the chaulmoogra oil warmed to 70° C. on a water bath, passing through filter paper and sterilizing at 100° C. on a water bath for one hour. Semiweekly doses at body temperature of 5 cc. into the deltoid, alternating with 8 cc. into the buttocks was the routine method. Of 24 lepers 6 showed marked, 12 moderate and 5 slight improvement within six months with very slight discomfrot.

vii. Attention is drawn to the work of E. MUIR showing that the sodium hydnocarpate called alepol can be given intravenously without vein trouble by the simple expedient of drawing up about an equal quantity of blood into the dose in the syringe, and injecting the whole after mixing by rotating the syringe on its long axis. Muir's iodide treatment is also reported to have been effective in clearing up the remaining lesions after nearly all the thickening of the tissues had been removed by alepol.

viii. In three cases herpes zoster occurred during the treatment of leprosy, with chaulmoogra ethyl esters in two, and with eparseno in the third.

L. R.

ARAUJO (H. C. de Souza). Tratamento moderno da lepra. Trabalho apresentado á Oitava Conferencia Sanitaria Pan-Americana, reunida em Lima, Perú, em Outubro de 1927, e lido na Academia Nacional de Medicina, de Buenos Aires, em 22-12-1927. [**The Modern Treatment of Leprosy. Article offered to the Eighth Pan-American Health Conference.**]—30 pp. [28 refs.] 1928. [Oswaldo Cruz Inst., Rio de Janeiro.]

An interesting, though necessarily compressed, account of chaulmoogra giving the history of its use from early days to the present, naming, with brief comments, the various preparations which have from time to time been proposed for treating leprosy, and giving the constitution of each. As such it is a useful compilation.

H. Harold Scott.

SHARP (N. A. Dyce). **A New Treatment for the Leper.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1928. Jan. 31. Vol. 21. No. 4. pp. 305–308.

The author refers to the common opinion that most improvements in leprosy with the chaulmoogra preparations follow severe reactions [the Culion workers hold the contrary opinion], and ROGERS has reported two exceptional cases showing prolonged and remarkable improvement after very severe reactions, while any value of HASSON'S vaccine treatment appears to be due to protein shock. These considerations led the author to try intravenous injections of 0·5 cc. of sterile tinned milkmaid brand or Ideal milk, diluted with 9 parts of distilled water, injected slowly into a vein as the most simple protein shock method available in the tropics. It produced in a few minutes giddiness, precordial pain with imperceptible pulse, respiratory distress with irritable cough, intense pain in the head, back and joints, and profuse perspiration, followed by a temperature of 103° to 104° F. All the

serious symptoms were recovered from in about 48 hours, and remarkable improvement in the way of cessation of pains, healing of perforating ulcers or absorption of nodules was seen in some advanced cases, and four out of twelve treated were followed up for as long as five months, and showed definite benefit, and two were able to resume manual work. He concludes: "This treatment, which is admittedly drastic and undoubtedly dangerous, seems to be applicable to the late and more hopeless forms of the disease." "Whether it would be of service in the early cases of childhood has yet to be determined. Probably, it would prove decidedly harmful." "Desperate remedies are sanctioned by desperate cases," so he commends this plan to the notice of medical men in charge of leper camps.

L. R.

EUBANAS (Froilan). **Observations on Five Cases of Leprosy treated with Javanin.**—*Jl. Philippine Islands Med. Assoc.* 1927. Nov. Vol. 7. No. 11. pp. 407–410. [5 refs.]

This Java preparation is said to be a protein-lipoid-insulin-free pig or beef pancreatic extract, which is claimed to raise the amount of fatty acids in the blood and to accelerate the action of lipase *in vitro*. In five cases treated by a series of 3 cc. subcutaneous injections totalling from 75 to 135 cc. in about three months, no appreciable benefit was noted, although a marked increase in the serum esterase was observed.

L. R.

MUIR (E.) & CHATTERJI (S. P.). **A Preliminary Note on the Use of Ephedrine in Leprosy.**—*Indian Med. Gaz.* 1928. Apr. Vol. 63. No. 4. pp. 198–199.

Adrenalin had been found to relieve the nerve pains in leprosy when used in febrile reactions, and the authors now report thirteen cases in which ephedrine sulphate, in doses of 0·05 to 0·1 gram in hard gelatine capsules orally, produced similar relief within one hour and lasting for 12 to 24 or more hours. In pains produced by iodides the same relief is afforded by taking a dose as soon as the pain commences, and it also appears to lessen the severity of the reactions after iodides, and has not the drawbacks of such drugs as opium. It appears to act by contracting the arterioles of the nerve trunks.

L. R.

FELDT (Adolf). Die Goldbehandlung der Lepra. Zugleich Beitrag zum Grundproblem der Chemotherapie. [**The Gold Treatment of Leprosy.**]—*Klin. Woch.* 1928. Jan. 8. Vol. 7. No. 2. pp. 73–77. [66 refs.]

The work of others on this method is discussed, and the author concludes that the various gold preparations used for leprosy since 1914, including aurocantha, gold potassium cyanate, krysolgan and solganol, act by stimulating the natural defensive processes of the body through the reticulo-endothelium, and thus excite the natural healing powers.

L. R.

PEYRE (E. L.). Posologie de l'antigène méthylique tuberculeux et son emploi dans la lèpre. [**Dosage of Methylic Antigen and its Use in Leprosy.**]—*Bull. Soc. Path. Exot.* 1928. Jan. 11. Vol. 21. No. 1. pp. 14–15.

Two cases of leprosy were treated for about two months only by this preparation (Nègre and Boquet) without material benefit, but longer trials are suggested.

L. R.

CRUZ (M. C.). **Ultraviolet Rays as Adjuvant in the Treatment of Leprosy.** —*Jl. Philippine Islands Med. Assoc.* 1928. Mar. Vol. 8. No. 3. p. 134.

Thirty-four lepers on chaulmoogra ethyl esters also received local exposures to ultra-violet rays from a quartz mercury vapour lamp over a period of eleven months, with a total time exposure of from 15 minutes to 18 hours, and for from 1 minute to two hours at a time. In closed lesions only temporary erythema without benefit resulted and trophic ulcers showed little or no reaction and they did not heal better than under other methods, so the results were nil.

L. R.

OTERO (Pablo Morales). **The Wassermann Reaction in Leprosy. A Survey of Forty-Two Cases of Leprosy isolated at the Insular Leprosarium. Preliminary Report.**—*Porto Rico Health Rev.* Vol. 2. Nos. 5, 6 & 7 & *Porto Rico Rev. of Public Health & Trop. Med.* 1927. Vol. 3. No. 5. 25 pp. With 4 figs. [23 refs.]

Forty-two lepers have been examined in Porto Rico with the Wassermann, Kolmer and Kahn tests; the author found a larger number complicated by syphilis than he had suspected, and that the Kahn test gave fewer positive reactions than the other methods, but that some uncomplicated leprosy cases do give positive reactions, especially during febrile lepra exacerbations. He also examined the cerebro-spinal fluid in 33 lepers, and found it to be normal and to give a negative Wassermann reaction, and also to be free from acid-fast bacilli.

L. R.

GIRARD (G.) & ROBIC (J.). Le réaction d'opacification de Meinicke dans la lèpre. Comparaison avec le Wassermann. [**Meinicke and Wassermann Reactions in Leprosy.**]—*Bull. Soc. Path. Exot.* 1928. Mar. 14. Vol. 21. No. 3. pp. 187–190. [3 refs.] [Pasteur Inst., Tananarive.]

The opacity test of Meinicke with the technique of Mutermilch has been used, together with the tests of Calmette and of Hecht, on 300 adults and 49 children of from 6 to 16 years of age and on 30 healthy children and 280 adult controls, all at the Pasteur Institute of Tananarive. They concluded that the first named test gave reactions in a certain number of syphilis free lepers, and that it did not enable the presence of that complication to be decided.

L. R.

LABERNADIE (V.) & ANDRÉ (Z.). Recherches sérologiques dans la lèpre. (Réactions de Matefy, de Wassermann). [**Serological Researches in Leprosy.**]—*Bull. Soc. Path. Exot.* 1927. Dec. 14. Vol. 20. No. 10. pp. 950–952. [5 refs.] [Bact. Lab., Pondicherry, French India.]

The reactions of Matefy proved of no practical value in the diagnosis of leprosy, and the Wassermann reaction was not more often positive in lepers than in the general hospital patients of Pondichery.

L. R.

GREVAL (S. D. S.). **Kahn, Microkahn and Wassermann in Leprosy.**—*Indian Jl. Med. Res.* 1928. Jan. Vol. 15. No. 3. pp. 683–686. [13 refs.]

The author has carried out these three tests in 112 lepers and an equal number of syphilitic suspects, with the result that the Wassermann reactions were almost identical in the two series ; the Kahn one showed a reduction in the positive rates in both series, but slightly less so in the lepers. He therefore is unable to agree with LLOYD, MUIR and MITRA, and PINEDA and ROXAS that the Kahn test is a more reliable one in excluding syphilis in leprosy.

L. R.

PEYRE (Edouard). Les réactions de fixation dans la lèpre. [**Fixation Reactions in Leprosy.**]—*Rev. Prat. Malad. des Pays Chauds.* 1927. Oct. Year 6. Vol. 7. No. 10. pp. 522–527.

The writer discusses the very variable results obtained by different workers with complement fixation tests in leprosy. He attributes them to the complicated nature of the blood changes in leprosy, and suggests methods of preliminary treatments of the sera to lessen these difficulties.

L. R.

JONES (Edgar) & TIRRILL, Jr. (W. O.). **Studies on Acid-Fast Micro-organisms. I. The Reactions of the White Blood Cells of the Rabbit following Inoculation with Leprosy Bacilli.**—*Amer. Rev. Tuberculosis.* 1928. May. Vol. 17. No. 5. pp. 522–536. With 5 charts. [33 refs.] [Dept. of Anat., Vanderbilt Univ. School of Medicine, Nashville, Tennessee.]

The authors have worked on the mechanism of stimulation by injections of an acid-fast bacillus (leprosy bacillus 365 of the Washington Hygienic laboratory), on the lines of the investigations by CUNNINGHAM and others regarding tubercle bacilli in rabbits, which showed an increase of the monocytes and a decrease of the lymphocytes with the progress of the disease. They also used rabbits and found a very temporary increase in both monocytes and lymphocytes following the injection of the acid-fast bacillus used, and no infection of the animals was obtained, so they consider that the large amounts of bacteria injected caused a temporary stimulation of the haematopoietic tissues of the animals.

L. R.

KEDROWSKY (W. J.). **The Microbiology of Leprosy Bacillus.**—*Jl. Trop. Med. & Hyg.* 1928. Jan. 16. Vol. 31. No. 2. pp. 17-21. [15 refs.] [Trop. Inst., Moscow.]

In this interesting paper the author first reiterates the claims of himself and others to have cultivated the lepra bacillus, and goes on to describe his recent work on the subject, which has led him to the conclusion that the organisms exist in three very different forms. Firstly, the acid-fast type, which grows readily on culture media; secondly, the non-acid-fast diphtheroid found by many workers at this vexed question; and thirdly, a more complicated actinomycosis form, the two latter appearing when the culture media are less nutritive in nature. In these respects it closely resembles the forms described in the case of the closely allied tubercle bacillus, and he thinks that both should be placed in the group of actinomyces or streptothrices-like microbes. He hopes later to publish a more detailed account of his last four years' work.

L. R.

ARAUJO (Oscar Silva). A proposito da reacção de Botelho. Seu ensaio na lepra. [**Botelho's Reaction in Leprosy.**]—*Folha Med.* 1928. Apr. 5. Vol. 9. No. 10. pp. 120–123.

By far the greater part of this paper is devoted to the question of Botelho's reaction in cancer, that of leprosy being mentioned only in the final paragraphs. Fifty cases of this disease were tested, 27 of the mixed form, 13 of the nodular, and 10 anaesthetic. Twelve of the first, nine of the second, and four of the third gave positive results. Taking all these forms together, therefore, it will be seen that exactly half were positive, so that its value as a diagnostic sign is nil.

H. Harold Scott.

GRAHAM (J. D.). La lutte contre la lèpre dans l'Inde Britannique. [**Anti-Leprosy Measures in British India.**]—*Bull. Office Internat. d' Hyg. Publique.* 1927. Nov. Vol. 19. No. 11. pp. 1632–1633.

This is a brief report on the progress of the campaign in India during 1926, and includes trials of avenyl dissolved in chaulmoogra oil preparations in cases complicated with syphilis, with the result of rendering the Wassermann reaction negative. It records also a great extension of the work of the Indian branch of the British Empire Leprosy Relief Association.

L. R.

LUIS CARRERA (José). La lucha contra la lepra en la república Argentina. Resultades obtenidos con los tratamientos modernos. [**The Campaign against Leprosy in the Argentine. The Results of Modern Methods of Treatment.**]—*Rev. Méd. de Barcelona.* 1928. Jan. Year 5. Vol. 9. No. 49. pp. 51–65.

After reviewing the question of leprosy in general in the Argentine during the last 30 years, a matter which has been dealt with again and

again in this *Bulletin*, the author places on record the results of the various remedies which have been proposed in recent years, such as injections of bismuth, tartar emetic intravenously (30 injections each of 0·1 gm. in 10 cc.), neosalvarsan, eparseno, mercurochrome in larger doses (the only result of which was a severe stomatitis), thiosulphate of gold, etc. These were employed in a very few cases only, some half a dozen, but in none was any benefit obtained. Cod-liver oil with thymol (Hamzah's formula) produced improvement but was inferior to chaulmoogra. Heiser's method with resorcin, camphor and chaulmoogra, caused much pain and gave no relief, though in one case 36 doses were given in 13 months, with a maximum of 20 cc., and a total of more than 500 cc.

The most satisfactory has been the ethyl esters of chaulmoogra injected intravenously, intramuscularly, or by both routes together. The first yielded better results than the second, but the third was best of all. Only 10 patients were treated by the intramuscular alone, and 9 by the intravenous, but the author considers that the latter is preferable for the young and robust, with the disease recently acquired and uncomplicated, and for those who respond to intramuscular injection by intense local reaction. The double route has been used in five cases, three nodular and one each of the nervous and mixed types. Hasson's injection, containing in 2 cc. 15,000 million *Ps. pyocyanea* and 5,000 million Hansen's bacilli, was given to two patients, using ¾ of an ampoule intramuscularly and ¼ intravenously, 20 injections at three-day intervals, with distinct clinical improvement.

H. Harold Scott.

MUIR (E.) & HENDERSON (John M.). **Rat Leprosy. A Record of Experimental Work carried on at the School of Tropical Medicine and Hygiene, Calcutta, between October 1925 and August 1927.**—*Indian Jl. Med. Res.* 1928. Jan. Vol. 15. No. 3. pp. 807–817. [10 refs.]

Further experiments are reported, from which the authors conclude that rats can be infected readily with rat leprosy by either scarification or subcutaneous or intraperitoneal inoculation, and occasionally only by feeding, but with a longer incubation period. Vitamin deficient diets do not increase the virulence, and the bacillus is killed at 60° C. in 25 minutes. Monkeys, rabbits and the Chinese hamster could not be infected with rat leprosy, and human leprosy material failed to infect rats, Chinese hamsters, or Japanese dancing mice. Calmette's B.C.G. culture had no effect in protecting rats against infection with rat leprosy.

L. R.

PINEDA (Eloy V.). **On the Persistence of** *Mycobacterium leprae* **in the Negative Leper.**—*Jl. Philippine Islands Med. Assoc.* 1928. Feb. Vol. 8. No. 2. pp. 65–67. [Culion Leper Colony, Philippine Health Service.]

This paper deals with the same work as the paper by the same author reviewed in this *Bulletin* of November, 1927, p. 908.

L. R.

ARAUJO (H. C. de Souza). O problema da lepra no Prata.—*Sciencia Med.* 1928. Feb. Vol. 6. No. 2. pp. 79–85.

BALIÑA (Pedro L.). Incidencias diagnósticas en un caso de lepra nerviosa.—*Semana Méd.* 1928. Feb. 9. Vol. 35. No. 6 (1778). pp. 313–316. With 1 text fig.

HOFFMANN (W. H.). Ueber eine allergische Reaktion bei der Lepra.—*Muench. Med. Woch.* 1926. July 30. Vol. 73. No. 31. pp. 1269–1270.

HOFFMANN (W. H.). Neue Aufgaben der Leprabekämpfung.—*Klin. Woch.* 1926. Oct. 15. Vol. 5. No. 42. pp. 1983–1984.

LANCET. 1928. Apr. 14. p. 792. With 1 text fig.—Leprosy in Iceland.

PUENTE (José J.) & PIERINI (Luis E.). Algo mas sobre bismutoterapia en la lepra.—*Semana Méd.* 1928. Jan. 5. Vol. 35. No. 1 (1773). pp. 52–53.

READ (B. E.). Is it possible to develop a Tolerance to Chaulmoogra Oil ? Metabolism Studies with Rabbits and Dogs.—*Far Eastern Assoc. Trop. Med Trans. Sixth Biennial Congress, Tokyo* 1925. Vol. 1. pp. 1015–1022 With 1 chart in text. [8 refs.]

YAWS AND SYPHILIS.

MANSON-BAHR (P. H.). **Yaws.**—*Brit. Jl. Ven. Dis.* 1928. Jan. Vol. 4. No. 1. pp. 44–54. With 3 text figs.

STANNUS (Hugh S.). **Yaws and Syphilis.**—*Ibid.* pp. 55–63.

Dr. Manson-Bahr dealt with the history, distribution, etiology, symptomatology and treatment of yaws together with the differential diagnosis from syphilis, and referred to the interesting conditions still of rather uncertain etiology, gangosa, goundou and juxta-articular nodules.

Dr. Stannus then reviewed the present state of our knowledge upon the viruses of yaws and syphilis in their relation to one another, including the supposed immunity to syphilis presented by some yaws-ridden populations and alluded to recent experimental work. A number of interesting points concerning clinical syphilis in indigenous races were brought forward and criticism made upon the clinical nomenclature in yaws and upon present methods of treatment.

Both speakers referred to a number of points requiring elucidation and to the urgent necessity for further and more intense research into yaws and its relation to syphilis. In the discussion Dr. CHESTERMAN referred to yaws in Belgian Congo, Dr. HANSCHELL related two cases who having had yaws, developed syphilis, Dr. Wilfred FOX dealt with the histology of yaws, and Colonel HARRISON emphasized the opener's pleading for further research and pointed out the necessity of such experimental work being most carefully planned to avoid numerous pitfalls.

H. S. Stannus.

RITCHIE (T. Russell). **Yaws.**—*Med. Jl. Australia.* 1927. Nov. 19. Supplement No. 13. pp. 401–402.

A short article from the pen of the Chief Health Officer, Samoa, mentioning the anti-yaws campaign being there carried on. He emphasizes points already made by other writers. Yaws attacked every child before the age of two years and caused both directly and indirectly much of the mortality among them. Primary and secondary lesions were never seen in adults. The natives resisted treatment of the children as they believed it would "drive the disease in" with detrimental results. Syphilis is said to be practically unknown among Samoans, and it is believed that yaws in childhood protects against syphilis. A systematic campaign against yaws was commenced in 1923, when 32,366 injections of N.A.B. were given; in 1924, 21,200, in 1925, 12,000, and for the first six months of 1926 just over 4,000. Three treatments at weekly intervals constitutes the course now given to all early cases with 10 per cent. of relapses. The author states that cure of every case is not aimed at, since if all the adult tertiary cases were treated they would lose their immunity and become liable to second attacks, until such time as all primary and secondary infections have been reduced to a negligible number.

H. S. S.

VAN DRIEL (B. M.). **Note on Framboesia in Sumatra.**—*Philippine Jl. Sci.* 1927. Oct. Vol. 34. No. 2. pp. 205–206.

In the *Philippine Journal of Science* for August 1926, a statement by WINCKEL is quoted by LOPEZ-RIZAL and SELLARDS to the effect

that "in Sumatra many cases (of yaws) are found at a height of 3,000 feet." Van Driel now writes to correct this statement, mentioning that WINCKEL had no personal knowledge of the country (the Batak plateau). Van Driel maintains, from some years of experience, that yaws is rare at this altitude in Sumatra as in Java, but found among the Karo Bataks at lower levels up to 100 metres above sea level.

H. S. S.

MAASS (Edgar). Die Framboesie im nordwestlichen Hinterland Liberias und ihre Behandlung mit Bismogenol. [**Yaws in the Northwest Hinterland of Liberia.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. May. Vol. 32. No. 5. pp. 221–229. [8 refs.]

——. **Notes on Rhinopharyngitis Mutilans.**—*Jl. Trop. Med. & Hyg.* 1928. May 1. Vol. 31. No. 9. pp. 102–103. With 2 text figs. [2 refs.] [Mission Hosp., Bolahun Liberian Mission, Order of the Holy Cross.]

The author writing from the north-western part of Liberia, where the population is heavily infected with yaws, has found rhinopharyngitis mutilans very common. It occurred in 1 per cent. of yaws cases seen. Response to treatment with bismogenol was very satisfactory. Syphilis in this area is said to be absent; only two cases, infected on the coast, were seen. The conclusion is reached that the affection under consideration is a manifestation of yaws.

H. S. S.

NAIR (T. D.). **A Tana River Yaws Campaign.**—*Kenya & East African Med. Jl.* 1927. Oct. Vol. 4. No. 7. pp. 201–207. [1 ref.]

Some account of an anti-yaws campaign in the Tana river valley in Kenya by Assistant Surgeon Nair. Twenty-five per cent. of the population of 11,748 received treatment by two (in some cases three) injections of sodium potassium bismuth tartrate at weekly intervals. Very few primary cases were seen and secondaries for the most part only among children. Among the tertiary lesions noted were all the usual manifestations. A number of cases of juxta-articular nodules were observed, some of gangosa and two cases of goundou.

H. S. S.

PEÑA CHAVARRIA (A.). Apuntes para el estudio de la Geografía Médica de la Framboesia en la República de Colombia. [**The Medical Geography of Yaws in Colombia.**]—*Abhandl. a. d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2). [Festschrift NOCHT.] pp. 57–61. With 1 map in text & 2 figs. on 1 plate.

Yaws was introduced into Colombia from Africa in 1525, and is now very widespread. Its distribution is heaviest along the rivers and on the coasts. MANSON-BAHR is quoted to refute the prevalent idea that yaws is very rare at heights of 300 metres above sea-level, the disease being found at 1,500 metres.

H. Harold Scott.

AYUYAO (Conrado D.). **Tertiary Manifestations of Yaws in the Nose and Throat in the Philippine Islands.**—*Jl. Philippine Islands Med. Assoc.* 1928. Nov. Vol. 7. No. 11. pp. 411–416. [College of Med., Univ. of the Philippines.]

A study of 62 cases; 32 males, 30 females; with age incidence in decades—1st 2 cases, 2nd 18 cases, 3rd 28 cases, 4th 5 cases, 5th 5 cases, 6th 4 cases. Of the 62 cases, all of whom came from yaws areas, 47 gave a history of yaws; in 12 cases with uncertain history all showed signs of the disease; in 2 yaws denied and no signs discovered. W.R. ++++ in 3, +++ in 8, ++ in 25, + in 18, — in 8. The author believes that the initial lesion occurs in the nose rather to the exclusion of the pharynx, though, of course, the pharynx or larynx may be primarily involved. In incipient cases the patients complained of "itching with deep-seated pain about the inside of the nose, dull in character, accompanied by a sensation of dryness." "On examination the mucosa of the nasal septum and the turbinals appeared to be moderately congested with sandlike granulations which were dry in appearance." No discharge. "There was hyperaesthesia [sic] for the patient seemed not to feel a tickling sensation when touched in that part of the nose." Infiltration progresses causing nasal obstruction and some swelling about the bridge of the nose externally. Ulceration follows with mucopurulent, sometimes foul, discharge and bleeding, and later destruction of cartilage and bone begins producing the characteristic picture of gangosa. Satisfactory results were obtained with neosalvarsan, the progress of the lesion was checked and healing took place.

H. S. S.

POLAK (H. J.). Ernste Knochen- und Gelenksveränderungen bei tertiärer Framboesie. [**Grave Changes in Bones and Joints in Tertiary Yaws.**]—*Arch. f. Schiffs- u. Trop. -Hyg.* 1927. Nov. Vol. 31. No. 11. pp. 530–536. With 8 text figs. [Military Hosp., Mageland, Java.]

Some observations on tertiary manifestations of yaws in Java and on the difficulty in making a diagnosis between these and tertiary syphilis except on the history of the case, and on X-ray examination when the rarification of bone seen in framboesial lesions contrasts with the thickening and sclerosis in syphilis. In this connexion the author points out, however, that in congenital syphilis a rather similar rarification may occur which is difficult to distinguish from tertiary yaws in a child infected when an infant.

H. S. S.

SCHÖBL (Otto). **Note on Local Terminology of Certain Manifestations of Yaws.**—*Philippine Jl. Sci.* 1928. Feb. Vol. 35. No. 2. pp. 127–132. [10 refs.]

[In summarizing the numerous papers on yaws from various parts of the world the reviewer has experienced, as, indeed, must other readers, some difficulty in interpreting the terms used by different writers. The growing need for a systematized description of the clinical lesions in yaws based on their underlying pathology was emphasized in a recent discussion (*Brit. Jl. Ven. Dis.*, Vol. iv, No. 1, 1928)].

An article by Schöbl, SELLARDS and LACY was summarized in this *Bulletin* (Vol. 24, p. 300). The present article is a criticism of that summary. Terms had been used and references made which had led to misinterpretation. It has had the happy result, however, of drawing from Schöbl a much clearer account of some of the interesting skin lesions he described in an article which everyone interested in yaws should read. He clears up the ambiguity in reference to the term "*clavos*" which obviously should never be used in medical literature, since it refers to three different lesions.

It is not possible to say more here as it would otherwise involve a long discussion upon most of the skin manifestations of yaws.

H. S. S.

i. WILLIAMS (G. A.). **A Report on Cerebral Symptoms in a Case of Yaws in a Male African.**—*Tanganyika Territory. Ann. Med. & San. Rep. for the Year ending 31st December, 1926.* pp. 105–106.

ii. CORSON (J. F.). **Extract from the Annual Report on Yaws and Syphilis.**—*Ibid.* pp. 109–110.

iii. GRAHAM (J. W.). **Clinical Summary of 559 Cases of Yaws treated.** —*Ibid.* pp. 119–126.

iv. TANGANYIKA TERRITORY ANNUAL MEDICAL & SANITARY REPORT FOR THE YEAR ENDING 31ST DECEMBER, 1926. pp. 131–132.—**Differential Diagnosis of Yaws (Tertiary) and Syphilis (Tertiary). Some Doubtful or Interesting Cases.**

i. Report of the case of a native who developed, a week after the last of three intra-muscular injections of bismuth sodium tartrate for florid secondary yaws, cerebral symptoms with coma and died twelve days later.

Post-mortem examination revealed lateral sinus thrombosis and "changes in the brain similar to those found in G.P.I." was reported by the director of the Pathological Laboratory to whom this organ was sent. No other lesions found in the body, no thrombosis of veins in buttock or abdomen. [No relationship was therefore established between the pathological lesions found and the disease and treatment which the patient suffered.]

ii. A statistical report containing no new facts of interest. The report loses value owing to the rather loose method adopted for dividing up the cases: thus cases of syphilis are shown under "primary," "secondary" and "tertiary," "congenital," "condylomata," with no mention of the inherited disease. Again it is stated that "as well as venereal diseases injections [bis. sod. pot. tart.] were given also in the following diseases: Tabes, psoriasis, skin diseases, periostitis, glossitis, paralysis, epilepsy." [Surely many of these were syphilitic or framboesial in origin.]

iii. An analysis of 559 cases classified as to nature of lesion distribution, with relative frequency of symptoms, etc. The figures resemble very much those which have been published before on yaws in East Africa. Juxta-articular nodules and gangosa are noted, but no cases of goundou were seen.

iv. A report on eight cases showing some of the difficulties encountered in differential diagnosis which are always to be met with in dealing with these diseases in natives.

H. S. S.

SCHLOSSBERGER (H.). Syphilis und Frambösie bei Mäusen. [**Syphilis and Yaws in Mice.**]—*Cent. f. Bakt.* I. Abt. Orig. 1927. Vol. 104. No. 1–4. pp. 237–239. [2 refs.]

The author previously showed that a mouse inoculated four months before with portions of a chancre from a syphilitic rabbit developed a latent syphilitic infection, i.e., showed no symptoms, but inoculation of portions of its lymphatic glands into rabbits resulted in infection. More recently he has extended these experiments and inoculated mice with other strains of syphilitic virus and with a strain of *T. pertenue* from NICHOLS. A piece of a sore from an infected rabbit was buried in a skin pouch on the mouse's back. This became absorbed in three weeks. No symptoms or signs developed but the mice could be shown ten months later to possess a latent infection. Later the mice were killed and blood and portions of their organs, gland, spleen and brain, were injected into rabbits by the intratesticular route. Blood was always followed by negative results, gland and spleen gave positive infections, and in the case of two syphilitic and two framboesial latent infections in the mice their brain tissue inoculations into rabbits were followed by positive results. He points out that it will now be possible to test antisyphilitic remedies on infections of the central nervous system in animals.

H. S. S.

MANTEUFEL (P.) & HERZBERG (K.). Beiträge zur experimentellen Syphilisforschung. Mitteilung F. Kaninchen-Framboesie. [**Experimental Work on Syphilis and Yaws.**]—*Abhandl. a.d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift NOCHT.] pp. 278–285. [14 refs.] [Reich Health Office, Berlin-Dahlem & Hyg. Inst., Acad. of Med. Düsseldorf.]

A short summary of the more recent work in the differentiation of the virus of yaws and syphilis by animal experimental inoculation. Reference is made to observations by NICHOLS, BROWN and PEARCE, JAHNEL and LANGE, REASONER, IKEGAMI, MATSUMOTO and TAKASAKI [already dealt with in this *Bulletin*] and to their own experiments with a yaws virus supplied by JAHNEL, originally obtained from NICHOLS. Attention is called to the want of uniformity in the results of different workers in many cases and to the necessity of gaining an insight into the causes at work. The conclusion is reached that so far, there is no certainty as to the unity or duality of the viruses of the two diseases.

H. S. S.

CHESTERMAN (Clement C.) & TODD (Kenneth W.). **Clinical Studies with Organic Arsenic Derivatives in Human Trypanosomiasis and Yaws.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1927. Nov. 25. Vol. 21. No. 3. pp. 227–232. [2 refs.]

The use of stovarsol is well known in yaws. Cyclosan is too toxic to be used. Ditroposan is too painful for subcutaneous injection and acts slowly; it therefore possesses no advantages over stovarsol. Halarsol (oxy-amino-phenyl-dichlorarsine) on the other hand has

proved extraordinarily potent in yaws. It is administered in doses of 0·5 to 1·0 cc. (=0·250 gm.) intra-muscularly or subcutaneously, two to three injections at three to four-day intervals.

H. S. S.

LANGERON (Jean). Pian et bismuth. [**Yaws and Bismuth.**]—*Bull. Méd. du Katanga.* 1927. Aug. Vol. 4. No. 2. pp. 48–50.

The author, while enthusiastic as to the immediate result of treatment of yaws by bismuth preparations, is of opinion that these do not take the place of arsenicals when cure with negative W.R. is aimed at. Bismuth and its salts may be looked upon as valuable adjuvants in the treatment, but their curative dose he considers lies too close to their toxic dose. Cases of return of the secondary eruption and also cases of resistance to bismuth have been met with.

H. S. S.

VAN HOORDE. Quelques cas de pian traités à l'aide d'injections intramusculaires de sous-nitrate de bismuth. [**Yaws treated by Intramuscular Injections of Bismuth Subnitrate.**]—*Bull. Méd. du Katanga.* 1927. Oct. Vol. 4. No. 3. pp. 104–106.

A short note on the good results obtained in the treatment of a series of cases of yaws at the Prince Leopold Hospital, Elisabethville, by four weekly intramuscular injections of a 10 per cent. oily suspension of bismuth subnitrate, 4 cc. at a dose in the buttock. Little pain or induration occurred and only in a single case was gingivitis produced, while on the other hand lesions cleared quickly, and the B.–W. reaction was favourably influenced.

H. S. S.

BOUFFARD (G.). Traitement du pian par le stovarsol. [**Treatment of Yaws by Stovarsol.**]—*Bull. Soc. Path. Exot.* 1927. Nov. 9. Vol. 20. No. 9. pp. 841–843.

Working on the Ivory Coast, the author, who believes that in stovarsol we have by far the most satisfactory remedy for yaws in young children, and speaks with the experience gained with 3,000 cases in 1925 and more than double that number in 1926, insists that the doses which have hitherto been used are insufficient. For infants and young children three tablets on each of two successive days is advised. Between the ages of eight and fifteen years four tablets on two days are necessary, after fifteen years four tablets for three days. He finds that relapse only occurred in 5 per cent., that resistant cases are rare, but that stovarsol even after prolonged courses has no influence on goundou.

H. S. S.

VAN NITSEN (R.). Traitement du pian par le tréparsol. [**Treatment of Yaws by Treparsol.**]—*Ann. Soc. Belge de Méd. Trop.* 1927. Nov. Vol. 7. No. 2. pp. 175–176. [6 refs.]

Unable to find any reference to the use of treparsol in the treatment of yaws the author gave it a trial among twelve adult natives. It

was given by mouth in tablet form ¼–1 gm. per day for the first four days in two successive or more weeks. The amount necessary for clinical cure varied from 4 to 15 grams.

H. S. S.

KOBER (Philip Adolph). **The Preparation of Potassium and Sodium Tetrabismuth Tartrates.**—*Jl. Lab. & Clin. Med.* 1927. July. Vol. 12. No. 10. pp. 962–967. [6 refs.]

Starting from the hypothesis that "the value of bismuth therapy in syphilis as shown by COLE, FARMER and MISKDJIAN depends upon the solubility and speed of absorption of the bismuth preparation used," the author set out to prepare compounds of bismuth and tartaric acid which would be more soluble than those at the present time in use. Two new compounds, sodium tetrabismuth tartrate and potassium tetrabismuth tartrate, are described having these properties; they are also less toxic; their mode of preparation is given at length.

Those interested will consult the original paper.

H. S. S.

SANNICANDRO (Giuseppe). Le nodosita juxta-articolari di Jeanselme. Eziologia, clinica, anatomia patologica. [**Juxta-Articular Nodules. Their Aetiology, Signs, and Pathology.**]—*Giorn. Ital. di Dermat. e Sifil.* 1927. Oct. Vol. 68. Year 62. No. 5. pp. 1418–1432. With 8 figs. on 2 plates. [3 refs.] [Dermo-Syph. Clinic, Univ., Bari.]

After reference to this well known condition as seen in natives, the author recounts those cases which have occurred in whites, both those who have been abroad and those who have not, and discusses the etiology put forward in each case. [These have all been mentioned in this *Bulletin*.] He then relates a case coming under his own notice. A male aged 48, who ten years after contracting syphilis in youth, noticed a swelling in the neighbourhood of the left knee, followed later by others about the right knee, the elbows and left shoulder. These had typical characteristics. The W.R. was positive and there was slight dilatation of the aorta; otherwise clinical examination was negative. There follows a report on the histological examination of an excised nodule and a discussion of the pathological anatomy without any new facts being produced, but for the Italian reader the paper forms a valuable summary of this interesting affection.

H. S. S.

ZIEMANN (Hans). Beitrag zur "Gundu-Frage" bei Affen und Menschen. [**Goundou in Man and Monkey.**]—*Abhandl. a.d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift NOCHT.] pp. 618–627. With 3 figs. on 1 plate. [26 refs.]

An interesting article discussing the various theories on the etiology of goundou and the possible relationship of that condition with the similar condition recorded by various observers as occurring in anthropoids, with a full account of the chimpanzee Sultan which remained under the author's observation from 1920 till its death in March 1923.

[The references are full and the bibliography a useful one; all interested in goundou and the osteitic changes in other bones, sometimes found associated with the paranasal swellings in man and monkeys, should consult the original article.]

H. S. S.

SCHÖBL (Otto). **Immunity in Yaws.**—*Jl. Philippine Islands Med. Assoc.* 1928. Jan. Vol. 8. No. 1. pp. 6–10.

A report on the results obtained by intradermal inoculation of yaws material into a local monkey by the Director of the Laboratory Bureau of Science, Manila. Inoculation is followed by an incubation period of one month, during which no clinical or serological changes occur. Towards the end of the second month local multiplication of the treponema occurs with implication of the deeper layers of the skin. Between the third and fifth months local exacerbation of the primary lesion is seen and metastatic generalization takes place with an increasingly positive W.R. Clinically three types of infection were seen. In the first a local yaw only; in the second a local yaw followed by secondary generalization, but without tertiaries; in the third a local yaw followed by ulcerative tertiary lesions or late framboesides without secondaries—this being, the author claims, the first time in the history of experimental framboesia that the metastatic and so-called tertiary lesions have been produced. It was further shown that reinoculation up to the fifth month of infected monkeys is followed by the appearance of a local lesion containing treponemas. In the sixth month the result may be positive in a certain proportion of animals, after which the animals are negative to superinfection, such immunity being proved to last for at least two and a-half years. It was also demonstrated that of animals reinoculated in the seventh month those which had received treatment in the first two months of the original disease could be reinfected, while those treated in the later months were immune. These experiments refer to animals which had only developed the primary lesion. As soon as secondary eruptions had manifested themselves animals were immune to superinfection, but immunity was longer delayed in those animals which developed so-called tertiaries. The author argues that it should be possible to immunize animals by inoculating with treponemata the deeper structures of the skin without the production of any skin lesions. In support of this contention a series of monkeys received in five weeks four subcutaneous inoculations of *T. pertenue*, and they were subsequently inoculated [presumably intracutaneously] at intervals. One animal inoculated one week after the last injection developed a yaw, but animals so treated 3 months after the last injection were immune. From this it is deduced that immunity is developed in the subcutaneous tissues, that it resembles that produced by vaccinia for smallpox, and that there is no evidence of "humoral antitreponematous immunity." Comparison is then made with the results obtained by SELLARDS and LACY in human experiments. [Schöbl gives no details of his experiments and with the single exception referred to above makes no reference to the work of others. The paper is not altogether clear and no explanation is offered of some of the results obtained.]

H. S. S.

MAXWELL (J. S.). **Yaws and the Kahn Test. (Preliminary Report).**—*Jl. Trop. Med. & Hyg.* 1927. Nov. 15. Vol. 30. No. 22. pp. 294–296. [American Mission, Nasser, Sobat River, Sudan.]

A preliminary report on serum reactions in 85 cases of yaws by Kahn's method. The author finds that, in the tropics where often the W.R. cannot be undertaken, Kahn's test promises to be of considerable value.

H. S. S.

HANSCHELL (H. M.). **Pyrexia in Primary Syphilis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1928. Jan. 31. Vol. 21. No. 4. pp. 295–298. With 3 charts in text.

Three cases are here reported coming under the author's observation at the V.D. clinic, Royal Albert Dock, which all presented a pyrexia of 99° to 102° F. the temperature immediately falling to normal and remaining so after an injection of an arsenical. All showed a small primary lesion (not immediately discovered in two cases) and some enlargement of inguinal glands; from the chancres *T. pallidum* was recovered in each case; also in each case the blood gave a positive W.R., but was negative for malaria. That a man may seek treatment for pyrexia in whom an initial syphilitic lesion may be present, but has not been noticed, is a point well worthy of remembering in tropical practice.

H. S. S.

WEI YU LIN. **Tabes Dorsalis among the Chinese. A Study of the Symptoms and Serology of Sixty Cases.**—*China Med. Jl.* 1927. Aug. Vol. 41. No. 8. pp. 698–711. [22 refs.]

The subject matter of this paper is an analysis of 60 cases of tabes admitted to the Pekin Union Medical College Hospital in five years, 1921–26, with a view to comparing tabes as seen in the Chinese with the disease as it occurs among Europeans. The general conclusions are that the incidence, sex ratio, age incidence, interval before onset are much the same. The following table deals in short with symptomatology :—

Tabetic Symptoms and Signs in Order of their Frequency.

		Per cent.
1.	Absent or diminished knee and ankle jerks ...	95
2.	Ataxia or staggering gait	79
3.	Romberg's sign	76·66
4.	Argyll-Robertson pupils	76·66
5.	Sensory disturbances	76·66
6.	Muscular hypotonia	73·2
7.	Disturbances of bladder	62
8.	Lancinating pains	55·66
9.	Unequal pupils	51·66
10.	Loss of sexual power	48
11.	Motor weakness of legs	30
12.	Ataxia of upper limbs	23·33
13.	Optic atrophy	23·33
14.	Girdle sensation	16·66

15.	Paresthesia	13·33
16.	Paralysis or paresis of eye-muscles	11·66
17.	Ptosis of eye-lids	10
18.	Arthropathies	10
19.	Mental symptoms	5
20.	Vertigo	5
21.	Visceral crises	3·33
22.	Difficulty in articulation	3·33
23.	Tinnitus in ears	3·33

Serum W.R. positive in 81·66 per cent., doubtful in 5 per cent.; negative in 13·33 per cent. Cerebrospinal fluid W.R. in 3 out of 8 negative cases was also negative, in the other 5 positive. In the 5 per cent. doubtful cases (3) cerebrospinal fluid W.R. positive in 1. In 55 of the 60 cases the cerebrospinal fluid W.R. was done—83·6 positive. Among 7 negative cases serum W.R. positive in 3. Cell counts, globulin and gold colloidal reactions are also mentioned.

H. S. S.

PARSONS (R. P.). Le traitement des ulcères tréponémateux par le bismuto-yatren. [**Treatment of Treponematous Ulcers with Bismuto-Yatren.**] —*Bull. Soc. Méd. d' Haiti.* 1927. July. Vol. 1. No. 3. pp. 43–51.

The substance of this paper has already appeared in the *American Journal of Syphilis*, 1927, Vol. 11, No. 3, and been noticed in this *Bulletin*.

H. S. S.

REZENDE (Motta) & FERNANDES (Eurico). Quarta doença venerea. [**Fourth Venereal Disease.**]—*Arch. Brasileiros de Med.* 1928. Jan. Vol. 18. No. 1. pp. 3–21. With 2 charts.

Subacute inguinal lymphogranulomatosis, or the disease of NICOLAS and FAVRE, in its earliest stage appears as a small erosion, so small as to be overlooked in many cases, since it is also painless. This gives place to ulceration, small nodules, papules and vesicles which in turn ulcerate. The condition is present on the glans, the prepuce, or within the urethra and precedes the adenitis by some days. Within the enlarged glands foci of suppuration arise and fistulae may result. The disease is very chronic and intractable.

[Among the synonyms given by the authors to the disease that of granuloma venereum is not mentioned, but from the description given, it appears that this is what they refer to; if so, much of the work of the last two years on the causation and treatment is omitted.]

H. Harold Scott.

KENYA & EAST AFRICAN MEDICAL JOURNAL. 1928. Jan. Vol. 4. No. 10. pp. 325–327.—Simple Notes on Some Tropical Diseases. A Popular Account of the Commoner Diseases of East Africa, with Hints on General Lines of Treatment, for the Use of Those Out of Reach of Immediate Medical Treatment. V. Yaws.

STEEL (C. R.). The Treatment of Yaws and Syphilis with Bismuth Sodium Potassium Tartrate, compared with that by Neokharsivan.—*Jl. Trop. Med. & Hyg.* 1927. Nov. 1. Vol. 30. No. 21. pp. 274–275.

CLIMATIC BUBO.

KOPPEL (Alice). Lymphogranuloma inguinale mit akuten rheumatischen Erscheinungen. [**Lymphogranuloma Inguinale with Symptoms of Acute Rheumatism.**]—*Klin. Woch.* 1927. Dec. 24. Vol. 6. No. 52. pp. 2469–2470. [7 refs.]

The author refers to the now common recognition of this disease in Europe. In Breslau All Saints' Hospital 49 cases were observed in 1925, in contradistinction to ulcus molle which has become very rare. Of the 49 cases, in 43 the local glands only were affected and fever and other general symptoms were temporary phenomena. In three the general symptoms were marked in comparison with the local signs. In three well-marked rheumatic manifestations occurred and these cases are given in some detail on account of the unusual feature.

In one characteristic erythema nodosum appeared on the leg associated with an acute episcleritis; in the second case there were painful swellings affecting joints of wrists, hands and ankles; while the third resembled the first case. This, the author states, adds one more to the resemblances of lymphogranuloma inguinale with ulcus molle, similar nodes containing Ducrey's bacillus having been described in the latter disease. In the lymphogranuloma cases Freische's reaction was obtained, but no attempt was made to recover a virus from the nodes.

H. S. Stannus.

WILMOTH (Clifford Lee). **Subacute Inguinal Lymphogranulomatosis. Report of Twenty-Seven Cases.**—*Southern Med. Jl.* 1928. Feb. Vol. 21. No. 2. pp. 108–113. With 1 text fig. [10 refs.]

The author reports twenty-seven cases under his care in Baltimore. All except one had shortly returned from elsewhere; one from India, two from Southern States, four from S. America and the remainder from the West Indies or Central America. On the etiological and pathological side the paper contains nothing new. Although the author is apparently aware of the protein shock and aspiration treatment advocated by HANSCHELL, in all except one case, excision or incision was practised.

H. S. S.

FISCHER (Otto). Ueber eine Hautreaktion bei klimatischen Bubonen. [**A Skin Reaction in Climatic Bubo.**]—*Klin. Woch.* 1928. Feb. 5. Vol. 7. No. 6. pp. 255–256. [6 refs.]

——. Ueber eine Intrakutanreaktion bei klimatischen Bubonen.—*Arch. f. Schiffs- u. Trop.- Hyg.* 1928. Feb. Vol. 32. No. 2. pp.91–92. [Inst. for Ship & Trop. Diseases, Hamburg.]

FREI first described a specific skin reaction in cases of lymphogranuloma inguinale found in Europe, using an emulsion from affected glands. Fischer now describes his results in 11 cases originating in other continents, cases which would be classified as climatic bubo, using as antigen fluid removed from European cases by gland puncture, diluted 5–8 times with normal saline and heated for 1½ hours to 60° ensuring sterility on culture. The local skin reaction varies from an area of redness with infiltration to the formation of a vesicle resembling a vaccine pustule and lasts up to 4 days, but is best estimated at 48 hours. There is no swelling of lymph glands and no general reaction.

In all 11 cases tested the reaction was positive, whether the disease was recently acquired, of old standing or retrogressing. In 11 controls the results were entirely negative; among these were cases of ulcus molle, syphilis and adenitis of other causation. There is thus very positive evidence that lymphogranuloma inguinale of Europe and climatic bubo of tropical countries are one and the same disease.

H. S. S.

HELLERSTROEM (Sven). L'intradermo-réaction dans la lymphogranulomatose inguinale. [**The Intradermal Reaction in Climatic Bubo.**] —*C.R. Soc. Biol.* 1927. Oct. 28. Vol. 97. No. 28. pp. 1168–1170. [1 ref.]

Working in Stockholm the author (who reported on twelve previous cases in *Acta Soc. Med. Suecanoe*, 1927, Vol. 53) gives his results with the intradermal reaction of FREI in fourteen further cases of what he designates inguinal lymphogranulomatosis. He used an emulsion of gland tissue from cases without fistula formation sterilized in a water bath at 60° C. for two hours, prepared by himself, and a similar antigen prepared by FREI and obtained positive results. Injection of the same antigen after being heated to 100° C. and an emulsion of Ducrey's bacillus gave negative results. Eleven cases of other venereal diseases were used as controls and were negative. Two of his cases contracted their disease in Haiti and Cape Verde Islands respectively, and might be called climatic bubo, from which he deduces that inguinal lymphogranulomatosis from which the other cases (presumably with no history of having been abroad) were suffering and climatic bubo are one and the same disease.

H. S. S.

FREI (Wilhelm). Beitrag zur Spezifität der Lymphogranuloma inguinale-Reaktion. I. Teil. Ueber eine Analoge, ebenfalls spezifische Reaktion beim Ulcus molle-Bubo. II. Teil. Zur Identität zwischen Lymphogranuloma inguinale und klimatischen Bubonen. [**Specific Skin Reactions in Lymphogranuloma Inguinale and Soft Sore. Identity of the Former with Climatic Bubo.**]—*Klin. Woch.* 1927. Oct. 22. Vol. 6. No. 43. pp. 2042–2044. [7 refs.]

After allusion to his previous work in this connexion the author deals with further experiments carried out. He finds that the skin reactions in lymphogranuloma inguinale and ulcus molle are specific in each disease, that these reactions, provided the antigen comes from some other unquestionable source, is a means of making a differential diagnosis, that a case of lymphogranuloma inguinale reacts positively with antigen from a tropical case of climatic bubo, proving that they are one and the same disease, that the skin reaction may be obtained many years after the infection.

H. S. S.

DUFF (D.). **A Case of Purpura following Climatic Bubo.**—*West African Med. Jl.* Lagos. 1928. Jan. Vol. 1. No. 3. p. 42.

The author describes under the above title the case of a European [presumably a male] admitted to Kumasi Hospital for pyrexia (99·6–100° F.) without any other evidence on clinical, blood or stool examination.

Some three or four weeks after the beginning of the fever and ten days after admission, the inguinal glands on the right side became painful and swollen. A diagnosis of climatic bubo was made and treatment, after other methods [not specified] had failed, by a few injections of iodoform in ether was given into the [sic] gland. Temporary improvement occurred, followed a few days later, by fever, joint pains, and the appearance of "four red painful raised areas, three on the legs and one on the right arm, about the size of a half penny or a penny. In appearance they resembled blind boils or erythema nodosum." The pains in the knee and elbow joints were severe, the original red areas turned blue while another crop appeared on the left leg. They were considered to be purpuric in nature and a sequel to the climatic bubo which had apparently cleared up. [The evidence does not appear to be conclusive.]

H. S. S.

DE BELLARD (E. P.). Sobre el tratamiento de la poradenitis inguinal sub-aguda. [**The Treatment of Subacute Inguinal Poradenitis.**] —*Gac. Med. de Caracas.* 1927. Aug. 31. Vol. 34. No. 16. pp. 242–244.

Glandular enlargement, for the purposes of this treatment, is diagnosed as above when the usual causes such as sepsis, venereal disease, and tuberculosis can be excluded. A case recorded is that of a man of 20 years with a glandular swelling the size of a hen's egg. He was given stibenyl intravenously in successive doses of 5, 10, 15, 20, 20, 20 cgm. on alternate days and the swelling, which increased after the first injection, thereafter steadily diminished till the glands were no longer palpable 12 days after the treatment had begun.

H. Harold Scott.

DE BELLARD (E. P.). Sobre el tratamiento de la poradenitis por el stibenyl. [**Stibenyl in the Treatment of Climatic Bubo.**]—*Gac. Med. de Caracas.* 1927. Dec. 31. Vol. 34. No. 24. pp. 371–372. [1 ref.]

The earlier hopes that stibenyl would prove a reliable specific for cases of climatic bubo have not been fulfilled. In the very early stages cure results, but in those of a later stage its use is followed by involvement of other glands both in the neighbourhood, and at a distance. For such, therefore, excision is recommended as the proper form of treatment, followed by a course of stibenyl starting the day after operation.

H. Harold Scott.

DESTEFANO (Francisco) & VACCAREZZA (Raul F.). Traitement de la poradénite inguinale subaigue par les injections d'émétique; résultats obtenus dans 85 cas. [**Treatment of 85 Cases of Inguinal Poradenitis by Tartar Emetic.**]—*Presse Méd.* 1927. Nov. 12. Vol. 35. No. 91. pp. 1378–1379. [2 refs.] [Infect. Diseases Clinic, Faculty of Med., Buenos Aires.]

The authors in 1925 published observations on cases of what in this country we call climatic bubo [see this *Bulletin*, Vol. 23, p. 227].

Since then their total of cases has reached eighty-five. In 18 the right, in 33 the left, in 34 both inguinal groups were affected. In 43 the glands were indurated, in 35 they had softened, in 7 fistulae were present. Antimony potassium tartrate, one per cent. solution in saline intravenously, has been the treatment adopted in all cases with excellent results. Commencing with 5 cc., 8 cc. are given in 3 days and subsequently twice weekly 10 cc. until cure has been obtained. Eight injections sufficed in 46 cases, 19 received 15 injections and 8 required 16–32 injections.

H. S. S.

GRANULOMA VENEREUM.

DE VOGEL (W.). La lutte contre le " granuloma venereum " chez les Marindinois, dans la Nouvelle Guinée Hollandaise. [**Granuloma Venereum among the Marindinas of Dutch New Guinea.**]—*Bull. Office Internat. d' Hyg. Publique.* 1927. Aug. Vol. 19. No. 8. pp. 1137–1145. With 1 fig.

In 1918 attention was called to the rapidly diminishing numbers of the Marindinois, a semito-hamitic tribe inhabiting the southern province of Dutch New Guinea. The cause was discovered by Dr. SITANALA in 1915 to be the very widespread infection with granuloma venereum.

A campaign against the disease, which is spoken of as an epidemic, was organized and carried on between the years 1922–1926 by Dr. THIERFELDER and his wife. They found from 12–35 per cent. of the population in various areas affected. The spread of the disease is ascribed to the promiscuous intercourse which their custom permits and to prostitution, but it is noted that though immigrant Malays have sexual access to women of this tribe suffering from the disease they appear seldom to contract infection, as if there were some racial immunity or long exposure were necessary ; among 5,000 cases studied only four Malays were seen. Incubation is put down at two weeks. Among the same total of cases in 38 there was said to be " generalization " by the blood stream, lesions occurring anywhere on the body, but with a predilection for the angle of the jaw. In a single case an abscess of the liver occurred the pus containing the " *Kalymno bacterium granulomatis.*" 5,736 cases were treated with tartar emetic along the usual lines, 86·1 per cent. were cured after one series, and 12·8 per cent. required further series of injections.

H. S. Stannus.

THIERFELDER (M. U.). Extragenitale Infektion mit venerischem Granulom. [**Extragenital Infection with Granuloma Venereum.**] —*Abhandl. a.d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26. (D., Med. & Vet. Vol. 2.) [Festschrift NOCHT.] pp. 553–555. With 2 coloured figs. on 1 plate. [3 refs.]

The author makes a distinction between cases in which extragenital lesions are secondary to genital lesions and cases in which the initial lesion is extragenital. In the literature he could only find a single

case (MAITLAND 1899) of this kind. There the mouth was affected and a venereal origin could not be excluded. The case of STOWERS and TEMPLETON was a doubtful case of the condition under consideration ; that recorded by SEQUEIRA and PEDROSO was obviously one in which the lesions had become generalized from a primary genital site and the same is true of the nine cases published by FOX.

Among 6,000 cases of G.V. treated in Dutch South New Guinea in 1923–26, two cases of true extra-genital disease were met with :—

Case I. A boy aged 10 years whose foster father was suffering from a penile lesion (G.V.) with a good deal of cicatrization about the meatus causing a stricture, which he was in the habit of dilating with a nail each time he wanted to pass urine. This nail he kept for the purpose, but also used it to dilate a perforation in his son's ear for the insertion of an ear-ring with the result that the boy developed a G.V. which grew to the size of a walnut and spread to the adjoining cheek. Treatment with considerable interruptions during one and a-half years by intravenous tartar emetic resulted in considerable improvement only.

Case 2. A woman aged 30 whose husband, by reason of a G.V. affecting the genitalia was unable to have normal sexual intercourse with her. She had been in the habit of giving manual relief to her husband's sexual impulses and developed a sore on her right index finger.

H. S. S.

GIBSON (E.). **Another Case of Ulcerating Granuloma.**—*West African Med. Jl.* Lagos. 1927. Oct. Vol. 1. No. 2. p. 15.

A note on a second case of ulcerating granuloma (granuloma inguinale) which responded after two weeks and had healed after two months' treatment with stovarsol and bismoxyl. The patient, a Kanuri boy of 19 years, showed widespread lesions of penis, scrotum and both inguinal regions. No further history of the case is mentioned.

H. S. S.

CAMPBELL (Meredith F.). **Etiology of Granuloma Inguinale. With Report of Eighteen Cases.**—*Amer. Jl. Med. Sci.* 1927. Nov. Vol. 174. No. 5. pp. 670–679. With 6 text figs. [14 refs.] [Bellevue Hosp., New York.]

Reports eighteen cases and experimental work done in connexion with them, summarized in the author's own words :—

" Granuloma inguinale is a clinical entity rapidly acquiring more general recognition and a literature of its own.

" It is found chiefly among negroes, particularly those from the Southern States.

" While affecting the genital and perigenital tissues chiefly, it is not a venereal disease ; transmission by sexual intercourse has not been observed.

" The etiology is indefinite, for while the intracellular inclusions described by Donovan seem to bear a direct relationship to the disease and are found with striking constancy, the disease has never been experimentally produced by the injection of these organisms (or what is considered morphologically and culturally to be these organisms) alone.

" Experimentally, we have obtained uniformly negative results in the reproduction of the disease by bacterial injection. To date, Koch's postulates have not been specifically fulfilled.

" Tartar emetic intravenously constitutes a specific treatment."

H. S. S.

CAMPBELL (Meredith F.). **Etiology of Granuloma Inguinale, with Report of Eighteen Cases.**—*Venereal Dis. Information.* 1928. Mar. 20. Vol. 9. No. 3. pp. 93–99. [14 refs.] [Bellevue Hosp., New York.]

The author gives an account of the disease as met with in 18 persons [see previous summary], all coloured save one. Donovan bodies were discovered in 11 of 17 cases in which they were looked for. For their isolation Sabouraud's medium (4 per cent. maltose peptone agar) is essential. Once isolated they grow well on the more common media with cultural characteristics in harmony with those of other observers. Attempts to infect guineapigs, rabbits, a monkey and two men failed.

H. S. S.

GOUGEROT, BERTILLON & ROQUES (Alice). Granulome vénérien français ou phagédénisme de Mac Léod-Donovan. [**Granuloma Venereum or McLeod-Donovan Phagedaena in France.**]—*Rev. Prat. Malad. des Pays Chauds.* 1927. Dec. Year 6. Vol. 7. No. 12. pp. 603–616. With 2 text figs. [2 refs.]

The report on a case of what the authors describe as a phagedenic ulceration of vulva and axilla in a woman who had entered hospital for polyuria and adiposity of pituitary type. The lesion began in the cruro-vulval fold and spread to the vulva, perianal region and rectum and to the axillae as a diffuse red pruriginous area which became ulcerated as the result of scratching with no glandular enlargement. The authors believe their case to be one of granuloma venereum in spite of certain clinical differences and the absence of Donovan bodies. The only organism isolated was Friedlander's pneumobacillus. W.R. negative. Treatment by local cauterization with silver nitrate and N.A.B. and mercuric cyanide internally were without result, but radiotherapy caused complete cicatrization in a short time.

H. S. S.

WEHRHEIM (Heinrich L.). [**Oral Infection in a Case of Granuloma Inguinale.**]—*Urol. & Cutaneous Rev.* 1927. Vol. 31. p. 760. [Summarized in *Venereal Dis. Information.* 1928. Mar. 20. Vol. 9. No. 3. pp. 124–125.]

A report on the case of a negro admitted to hospital suffering from ulceration of the right groin for six years and for six months ulceration involving the mucus membrane of the left cheek, superior alveolus, hard and soft palate from which Donovan's bodies were recovered and which healed under treatment with tartar emetic.

H. S. S.